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STEEL

The Magazine of Metalworking and Metalproducing

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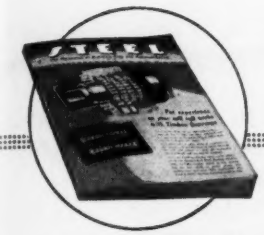

August 29, 1949

Expert Counsel

On Dec. 30, 1947 President Truman signed Public Law 395, an anti-inflation measure which, among other provisions, authorized the establishment of the Office of Industry Cooperation in the Department of Commerce to administer voluntary allocations of steel and pig iron. OIC was organized in January, 1948, and John C. Virden, Cleveland industrialist, was appointed head of the organization. One of his first acts was to appoint a steel producers advisory committee consisting of 23 representatives of integrated, semi-integrated and nonintegrated steel companies.

Among these 23 representatives were many of the ablest executives in the steel industry. From early in 1948 until well into 1948—during the period of acute steel scarcity—they worked hard and conscientiously to see that steel was diverted fairly to the various steel allocation programs. After the need for allocated steel had subsided, Earl W. Clark, who succeeded Mr. Virden as head of OIC, told this publication that the "splendid co-operation" given by the steel company representatives to OIC presented "an excellent demonstration of how government and industry can plan a program and carry it out."

Persons familiar with the work of the Steel Producers Advisory Committee under OIC know that Mr. Clark's tribute is fully merited. They know also that the participation of these steel experts in conferences where the problems of tight steel supply were discussed resulted time and time again in the abandonment of unwise proposals introduced by well-meaning persons who had little or no knowledge of the problems of steel distribution. In short, the presence of experienced steel men in these councils blocked scores of impractical schemes and saved the nation and the industry an incalculable amount of grief, time and money.

The need for OIC has passed and it and its advisory committee are due to expire Sept. 30. However, other problems involving relations between industry and government constantly demand attention. Also there is criticism that the Department of Commerce is not the champion for industry that the Department of Labor is for unions or that the Department of Agriculture is for farmers.

Why not correct this in part by creating a continuing advisory committee from the steel industry to work with Commerce on matters of mutual interest?

* * *

BARRELS OF EVIDENCE: In some quarters there has been criticism that some steel company executives appearing before the President's fact-finding board have placed more emphasis upon protesting against the existence of the board and the President's action in creating it than upon the presentation of real evidence to combat the arguments of the unions.

It is true that the steel industry's objection to substituting this fact-finding board for the mechanism of true collective bargaining has been played up prominently in newspaper headlines, but it is a mistake to assume from this that the steel companies have been negligent in presenting real facts to the board. On the contrary, steel companies—large and small—have submitted such a mass of carefully prepared, detailed information that it will be physically impossible for the board to give it the attention it deserves.

Some of the evidence submitted by smaller companies reveals careless mistakes in exhibits submitted by the union. In one instance the union credits one company with 10 times as

(OVER)

many employees as it actually employs. In numerous union exhibits a company's 1949 profits are "estimated" at four times actual first quarter earnings. Some companies only remotely connected with the basic steel industry find themselves swept into the hearing purely because their names are on a union list.

The board simply cannot adduce "facts" that will be fair to all. —p. 31

* * *

ASK FOR FEWER STEELS: Prior to World War II steel producers did a creditable job of materially reducing the number of standard grades of steel. In spite of this, some authorities now believe that there are still too many steels listed. To support this view, they refer to the steels listed by the Society of Automotive Engineers or the American Iron & Steel Institute and contend that many of the numbered steels are so similar that some could be eliminated.

Persons who have looked into this problem believe that relief from too many steels must come from steel consumers. It is argued that by carefully studying their requirements and by a willingness to make some slight changes, many users could shift to the more common steels, thus eliminating many that are less frequently specified. Certainly a reduction in number of steels would be beneficial. —p. 60

* * *

IDENTIFYING MATERIALS: Considering its importance, the subject of identification of engineering materials has not received the attention it deserves. Executives seeking new ways to cut costs may find it profitable to trace bar stock, castings, sheets, strip, forgings, stampings and other items from the time they arrive at the receiving platform until they go into the production or assembly line. This investigation may uncover unsuspected losses caused by failure to retain the proper identification of materials throughout the chain of manufacturing operations.

Anybody who studies the problem of identification seriously will be appalled at the ease with which the identity of a material can be lost. One relatively minor mistake in identity can lead to almost unbelievable losses. The best insurance against these losses is to adopt a sound identification system, give a well qualified man authority to administer it, and inaugurate a series of periodic checks to see that a high standard of efficiency is maintained. —p.66

* * *

BATTERY DEMAND IS UP: Willard Storage Battery Co. is stepping up production to a level that will necessitate a working schedule of nine hours a day, six days a week. Behind this sharp increase in operations is a curious story of how the demand for automobile batteries has been affected by weather, design and other factors.

Demand for batteries for automobiles hit a postwar low last spring. This was due in part to the fact the mild winter of 1948-49 had given an indian summer of life to thousands of old batteries. However, the excessive heat of recent summer months has been particularly hard on batteries. Also, auto design changes which have placed the battery closer to engine heat, more cars on the road, greater mileage and higher charging rates have affected battery life. Today the average battery lasts two-thirds as long as its prewar predecessor, although its quality is much higher.

Lead prices reflect the battery situation. Last June lead was quoted at 11.80 cents per pound. Today it is 14.92½ cents. —pp. 33, 104, 105

* * *

MOVE NEARER TO STEEL: During the past year there has been a noticeable tendency among large manufacturers to locate captive fabricating plants near to important sources of steel supply. Within recent months a number of corporations have established large fabricating units in close proximity to steelworks in the Pittsburgh area. Now Ford Motor Co. is building a large pressed steel plant at the back door of the Lackawanna plant of Bethlehem Steel Co. in the Buffalo area.

Presumably the drastic change in the method of pricing steel is a factor in decisions to form steel nearer to the source of supply, but there are other advantages. In fact, Detroit observers, after weighing the aspects of the Ford-Bethlehem set-up at Buffalo, are of the opinion that should Ford decide to dispose of its River Rouge steel division so that it could concentrate exclusively on manufacturing cars, trucks and related products, Bethlehem Steel would be the logical buyer and operator. —p. 45

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

STEEL WAGES—Business men everywhere are awaiting the outcome of the steel wage dispute (p. 31). Industry spokesmen will complete their case Tuesday before the President's fact-finding board, which then will begin to draw its report and recommendations. There is no assurance that either side will accept the board's recommendations, and the possibility of a long and bitter strike cannot be discounted too sharply . . . Steel buyers (p. 33) believe prices will remain firm over the remainder of 1949, as result of the uncertainty over costs arising from government intervention in the steel wage dispute. Purchasing agents expect a downward steel price trend in 1950, provided a heavy wage increase is not forced on industry.

FORD-BETHLEHEM— Decision by Ford Motor Co. to build a new pressed steel plant at Bethlehem Steel's back door in the Buffalo district revives speculation (p. 45) on the possibility of a closer tie-in between the two companies. Ford has been considering sale of its steelmaking facilities. Bethlehem is seen as a logical buyer.

MORE KIDS, MORE STEEL—Schools offer a substantial market (p. 42) for the products of the steel and metalworking industries: Structurals, pipe, hardware, heating and ventilating equipment for buildings, lockers, seats and desks, and office equipment for the school rooms, and busses to transport children to and from the schools. The population of school-age children will increase sharply over the next decade, necessitating a large-scale expansion of educational facilities.

BIG BUSINESS— Basic steel is one of the nation's most concentrated industries, Federal Trade Commission reports (p. 34). The commission's study prepared for Congress also says that the aluminum production and tin can manufacturing industries have their economic power divided among only a few companies.

RIVER DEVELOPMENT—River development programs in steelmaking centers may spur the movement toward more metalworking plant concentration near mills, already influenced by f.o.b. pricing and higher freight costs (p.35). The trend could get further impetus from the obscure Truman-Hobbes act which permits government financial aid in rebuilding bridges. Need for bridge reconstruction has slowed many waterway development projects.

ALLOCATIONS TO END—Voluntary allocations program will end Sept. 30 to close a 21-month career (p. 38). Office of Industry Cooperation has handled 19 projects in steel and pig iron since it was formed. Fifteen will be continued until the expiration date. At its peak OIC allotted 581,233 tons of steel monthly, last April and May, and 106,830 tons of pig iron, during the fall of 1948.

BRITISH TROUBLES—Two economic parleys in Washington—beginning on Sept. 6 and Sept. 13—will focus attention on the problems of Great Britain and the sterling area (p. 41). The conferences will deal with trade and monetary matters.

HERE AND THERE IN INDUSTRY—Machine tool makers are using eye-catching displays and rental-with-option-to-buy plans to boost sales which in July fell again to set a postwar low (p. 37) . . . Dresser Industries Inc. is boosting its oil and gas equipment export volume by a three-way barter system (p. 43) . . . Truscon Steel Co. will expand through purchase of a Canton, O., plant (p. 48) . . . Colmol Co. is a new corporation owned jointly by Jeffrey Mfg. Co. and Sunnyhill Coal Co. to produce and market the "colmol" (p. 48) . . . Auto battery demand is rising (p. 33) . . . Alloy steel production is back to its prewar tonnage relationship to total steel output (p. 34) . . . Members of the National Association of Power Engineers were warned at their Chicago meeting last week to fight air pollution (p. 36) . . . A national symposium on atmospheric pollution will be held in California this fall (p. 42) . . . Marinette Marine Corp. has developed a device to eliminate boiler and furnace gas and smoke (p. 34).

Engineering News, p. 59 *Market Summary, p. 99*

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Steel Wage Decision Awaited

Fact-finding board to complete hearings, begin preparation of recommendations this week. Union prepares for possible strike. Management resistance to higher costs firms

INDUSTRIAL executives throughout the nation are awaiting anxiously the report by the President's fact-finding board in the steel wage dispute and its acceptance or rejection by industry and labor.

When the hearings end Tuesday, the board will begin preparing its recommendations. Until these are known and the reaction of both parties to them can be ascertained, business men will proceed cautiously. Many important decisions are being delayed pending resolution of the case, which many consider the most momentous of recent years.

Peaceful settlement or strike? The chances are considered even by most industry observers.

Union Prepares—The United Steelworkers is ready to strike if it fails to obtain what it considers a "fair" settlement of its wage, pension and insurance demands, President Philip Murray told the board last week.

Union activities in the steel towns indicate the locals are preparing for a possible work stoppage. Meetings are being held to whip up sentiment for a strike. Petitions are being circulated among workers to gather evidence of support for union action. The union in July distributed a list of 27 regulations on conduct should a strike be called.

Pamphlets designed to generate enthusiasm for a walkout are being distributed at steel plant gates. Other pamphlets are being printed. Local union officials are being instructed on organizing strike machinery, appointing of picket captains, obtaining of posters, arm bands, serving of food to pickets and similar details.

Merchants in steelmaking towns around Pittsburgh report retail sales have fallen sharply as steelworkers watch their expenses in anticipation of a strike.

Spot checks of steelworkers by independent newspapers and other agencies indicate that the workers definitely do not want a strike but will support one if necessary.

Management May Resist — Steel management repeatedly has declared that it will not consider the recommendations of the fact-finding board as binding. During the presentation of evidence before the panel, industry executives indicated they will resist any recommendations for substantial wage increases or pension and insurance concessions.

"No increase in cost whatever should take place at this time," was a frequently heard statement during the industry presentation.

Intimations were strong that a substantial number of the steel executives would face the prospect of a strike rather than grant any large increases.

Charles M. White, Republic Steel president, told the board that strikes are "a hell of a good way" to work out disputes that cannot be settled by collective bargaining. "I have never been in one that did not come to an end—and there are worse things than a strike."

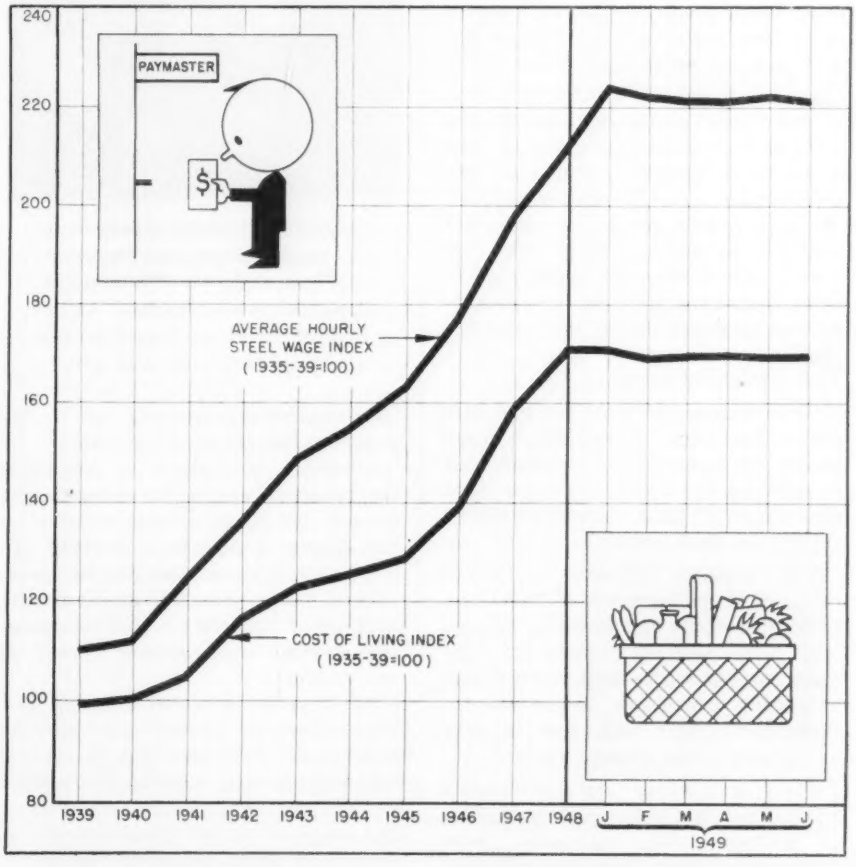
Could Be Long and Bitter—If a strike should develop out of the steel wage dispute, it is likely to be long and bitter. The issues run deep. They affect not only the steel industry but all business.

The government already has intervened in the dispute through the mediation and conciliation service and through the fact-finding board. If the recomendations of the board are rejected, the administration may find that it has exhausted its ammunition and dispute will have to be slugged out by labor and management.

Hearings Extended—Hearings before the board will continue through Tuesday to give the companies time to complete their rebuttals. How long the board will require to complete its recommendations and send its report to the President was undetermined late last week.

The Union Case

Demands by the United Steelworkers call for a 12½-cent hourly pay



GAINS OF DECADE: Real wages of steelworkers have increased substantially since prewar, as hourly wages rose faster than the cost of living. Recent decreases in consumers' prices caused the union to soft pedal the cost-of-living argument in current wage arguments

increase, pensions of $125-a-month at age 65, and a comprehensive social insurance program. The union estimates the cost of this package to be 30 cents an hour, a figure which is disputed by the steel companies, who say that the union underestimates pension and insurance costs and that the package would cost some companies as much as 70 cents an hour.

The union arguments before the board brought no surprises. All the steelworkers had to pull out of the hat was Robert N. Nathan, former government economist, who prepared a report in support of the union's demands. The Nathan report was target for much criticism during the hearings.

In distilled form, the union case is this: 1. The steelworkers need or want an increase; 2. steel company profits were good in 1948 and first half of 1949, indicating the industry is able to pay; 3. higher wage would mean greater purchasing power and help avoid a recession.

Absent from the union arguments was the old favorite about rising living costs. In its place, the union talked about the increased productivity of workers.

In asking pensions, the union argues that the steel companies set aside large sums for depreciation of plant and equipment. Why should they not set aside similar funds for the depreciation of manpower?

In asking for more comprehensive insurance programs, the union uses a similar argument. Companies pay considerable sums to maintain plant, machinery and equipment in good working condition. Why, asks the union, should they not spend similar sums to take care of workers' illnesses, accidents and similar misfortunes?

The Industry Case

Steel spokesmen hold in the first place that the fact-finding board should not have been established, that it bypasses the law. They argue that the issues in this dispute should be settled by free collective bargaining.

The industry opposes a fourth round of wage increases at this time. Steel operations and business in general have declined. Further wage increases cannot be absorbed without increasing prices. If prices are increased, demand will drop further and create more unemployment.

Steel executives and economists pointed out that the first three rounds of postwar wage increases were highly inflationary, brought little lasting benefit to the steelworkers, and created grave dislocations in the national economy.

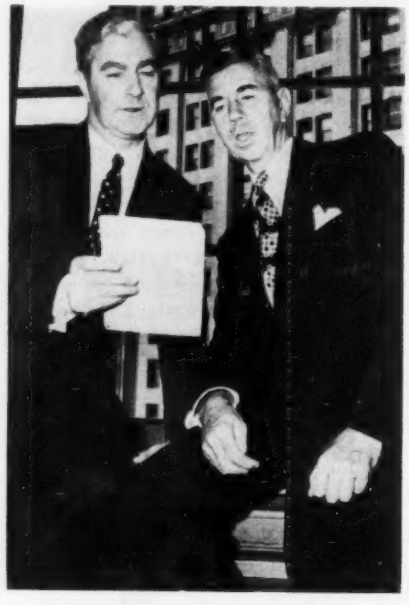
Ability to pay was termed by the steel men as an improper measure for determining a sound wage structure. Future wage increases, they said, cannot be paid out of past profits.

One analyst summed up the case against wage increases this way:

1. The steel industry is in a recession and the steel operating rate is headed for 65-70 per cent of capacity.

2. The retained profits of 33 reporting steel companies are down 83 per cent in the second quarter. An increase in wages would wipe out retained profits for most companies.

3. If a fourth round of wage increases occurred at this time, there is danger of a sharp decline in private capital expenditures due to the reduction in retained earnings.



STAGGERED: Union demands on the steel industry are "staggering," says C. M. White, right, Republic Steel president. At left is T. F. Patton, Republic vice president and counsel

4. There is danger of deepening the recession and of throwing it into a very unhealthy phase in 1950.

5. There is danger of making unemployment worse than will be necessary if labor were willing to pursue policies of moderation and co-operation during the delicate phases of the recession.

6. There is danger of creating specially favored groups on the one hand, and of injured groups on the other hand; this includes the danger of injuring agriculture by putting the farmer at a disadvantage as compared with industrial labor.

Small Companies Jeopardized

Nearly a score of smaller steel companies told the board that the wage and other concessions asked by the union would work greater hardship on them than on the larger integrated companies.

Any pay rise at this time, they say, would jeopardize their future and would be economically unsound for all business.

Concern of the little steel companies is intensified by the fact that a number of them have been operating "in the red" in recent months because of the decline in business and the disappearance of premium prices.

The small companies say: As a general rule, our labor costs per ton of steel produced are higher than the costs of the large companies. Our margins of profit are generally smaller than our big competitors'. Most of us make only a few specialized products rather than the wide diversity of items which gives the large companies a cushion when sales waver. Most of us are forced to purchase our raw materials and surely will have to pay more for them if a fourth-round wage boost is permitted.

"We are realistic enough to know that any recommendation by the board, without qualification as to individual situation, will present the union with a bargaining weapon which will be used with all companies on a take-it-or-leave-it basis. This weapon, if handed to the union, will make a mockery of the collective bargaining process."

Steelworkers Restive

Restiveness of the United Steelworkers came to the fore in Gary, Ind., last week, all subsidiary plants of U. S. Steel being affected by dues picketing in which it was estimated some 5000 union members took part.

Beginning on Tuesday with picketing at Carnegie-Illinois' Steel Works and Sheet & Tin plant, the plants of American Bridge, National Tube and Universal Atlas Cement Co., the activity on subsequent days was largely confined to the basic steel mills. Pickets demanded a show of union membership cards before admitting entrance to most of the workers. A contingent of women accounting department employees massed in a wedge to enter one plant without interference.

Petrol Truck Drivers Strike

Metalworking operations in the Chicago district are beginning to be affected by a strike by gasoline and fuel oil truck drivers. Small heat-treating shops without sizable storage facilities were running short of fuel oil last week.

PAs See Prices Holding

Wage increase would up costs, strike create scarcity. Either defers price cut

STEEL purchasing agents expect steel prices to remain firm over the remainder of 1949. This is a direct reversal of opinion expressed by the buyers 60 days ago.

Reason for the change, as expressed by the steel committee of the National Association of Purchasing Agents: If steel wages go up, even moderately, costs go up. If steel mills are struck, a scarcity will develop. Therefore, prices are not likely to fall this year.

Looking ahead to the next six or twelve months, the purchasing agents are almost unanimous in expecting that the trend of steel prices will then be downward. Whether inflationary forces in the meantime will counteract this trend depends largely on the outcome of the steel wage dispute.

Demand Firmer—The PAs find that steel demand has increased enough since mid-July to give a much firmer basis to the market. Some of the pickup is due to fear of a general steel strike in September or to a series of individual mill strikes. The real force behind increased buying, however, lies in inventory replenishment and sustained demand for appliances and automobiles.

Spot rollings of emergency tonnage are not so easy to obtain as they were a few months ago, but most steel items are obtainable on six weeks' delivery. Exceptions are line pipe, galvanized sheets and plates.

Delivery Charges Raised

CHARGE for city delivery of steel from warehouses in Chicago and Boston has been raised 5 cents per 100 pounds. New rate is 20 cents per 100 pounds.

Until the increase was effected in these two cities the prevailing rate throughout the nation was 15 cents, except in New York City where the 15-cent charge was abandoned in favor of a 20-cent rate a year ago.

The upward revision at Chicago resulted from increased concern among warehousemen over cost of truck transportation. Belief has been that the flat delivery charge of 15 cents per 100 pounds was insufficient to cover cost of this service. Contract carriers which serve most of the district's distributors charge for their work on an hourly basis, rather than for individual trips, and the cost of cartage is averaged out by warehousemen to arrive at a uniform charge to each consumer for the delivered price of his steel.

The action at Chicago was reluctantly taken, price competition being intense among warehouses there. Distributors who were unwilling to make the first move immediately followed suit, however, when a few other companies took the initiative and made the increase.

Battery Demand Rises

Hot weather, not cold, shortens battery life. Demand may approach peak by yearend

WEATHER is causing the demand for auto batteries to rise.

Bouncing from a postwar low during the spring, demand in June picked up, strengthened more in July and August and by the end of the year may be near postwar peaks. Indicative of the change is the move by Willard Storage Battery Co., Cleveland, which is starting to work six days a week, nine hours a day. Units for new and replacement equipment in autos account for nearly 85 per cent of the battery industry's volume.

Heat Hits Batteries—Heat, not cold, shortens the life of an automobile battery. Heat during the summer can weaken a unit to the extent that it may fail during the first few cold snaps of winter when more strength is required. The mild winter of 1948-49 gave an indian summer of life to many batteries, but the deferred demand is beginning to be felt now. Normal seasonal needs are coming on top of this. High summer heat is pyramiding the demand, and added to everything is the problem of storage damage. Batteries manufactured for what was expected to be a normal 1948 season were in some cases improperly stored by dealers and have lost part of their strength.

Demand Up—At the beginning of the 1948 season, battery demand was 35 per cent heavier than in 1939 because of more cars on the road, greater mileage, higher charging rates and auto design changes which place the battery closer to engine heat. Today the average battery's life is one-third shorter than prewar even though quality is higher.

The battery situation is largely responsible for gyrations in the lead price. About 33 per cent of the total output of lead goes into batteries. Lead last June was at a low of 11.80 cents per pound. It has risen to 14.92½ cents since the battery makers resumed high output.

Clarke Goes Abroad

REPUBLIC Steel Corp. is emphasizing its export business more in a move to offset lagging domestic sales.

Norris J. Clarke, Republic's senior vice president, and L. I. Underwood, assistant export manager, leave early in September for a two-month tour of the leading European countries and Iran and Iraq. Sales efforts will be concentrated on alloy and stainless items, carbon bars and other products for which demand has declined in the United States.

Mr. Clarke, a veteran of 52 years in the steel industry, retires Dec. 31. He integrated Republic's present world-wide sales force out of the more than 10 sales organizations of firms which went into the corporation.

Kitchen Cabinet Sales Down

MANUFACTURERS' SALES of steel kitchen cabinets in the first half of 1949 fell about 38½ per cent below those of the first half of 1948, but an upturn occurred in May and continued through June, the Steel Kitchen Cabinet Institute, Cleveland, reports.

Dealers are buying on a hand-to-mouth basis, but that they are buying indicates they have completed inventory reductions. Result, institute points out, is that new sales by dealers require production line activity at manufacturing plants.

Sales of steel kitchen cabinets last year totaled 3½ million units valued at $138 million, a new record.

San Francisco Employment Lags

SAN FRANCISCO area employment is below that of a year ago.

Although the number of manufacturing workers increased by 1500 in July over June, all durable goods industries but auto assembling were employing about 7000 less than in July, 1948.

Pricing Case Date Advanced

STEEL companies have been granted an extension to Sept. 25 for filing briefs seeking dismissal of Federal Trade Commission charges against steel pricing practices.

Alloy Steel Production

Returns to prewar tonnage relationship to total steel industry output

ALLOY STEEL production is back to its prewar tonnage relationship to total steel output.

In June, alloy production comprised 5.47 per cent of all steel produced for ingots and castings, compared with an average of 6.08 per cent for all of 1939.

Preparedness and wartime needs multiplied importance of alloy steel and in 1943 alloy constituted 14.80 per cent of total steel production. A modest decline followed until 1948 when a slight upturn occurred. A downtrend set in during early 1949 and continued unarrested through June.

Up and Down—Trend over the last decade is indicated in the accompanying chart, and in additional detail in the following table showing the per cent alloy steel was of total steel produced for ingots and castings:

	%		%		%
1938	5.20	1942	13.39	1946	9.12
1939	6.08	1943	14.80	1947	8.75
1940	7.41	1944	11.86	1948	9.56
1941	9.91	1945	10.85		

1949

	%		%		%
Jan.	9.62	Mar.	8.50	May	5.59
Feb.	9.45	Apr.	7.45	June	5.47

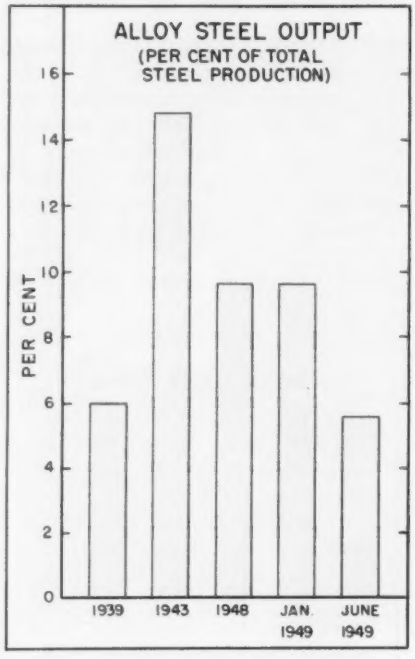
Closely paralleling this pattern has been production by Republic Steel Corp., a leading producer of alloy, it was revealed by C. M. White, the company's president, in his written statement to the Presidential Steel Board which has been hearing arguments for and against wage, pension and insurance demands made upon the steel industry by the United Steelworkers of America-CIO.

Mr. White testified that in 1939 alloy steel constituted 10 per cent of Republic's total steel output and was the same in June, 1949. In 1948 percentage was 15, he said, adding that the percentages by months in the first half of 1949 were: January, 17; February, 15; March, 16; April, 15; May, 12; and June, 10.

Output Stepped Up—In the last few weeks alloy production has been stepped up but so has carbon steel output. Consequently, the ratio of alloy to total steel is not expected to increase greatly. Producers are not confident any gain will be long lived. While they believe some of the recently increased demand stems from completion of inventory reductions by consumers they admit that a substantial part of the upturn comes from the move of consumers, notably the automotive industry, to lay in enough steel to last through a steelworkers' strike, should one occur in September.

Because of strengthened demand Republic Steel's alloy division has boosted operations, now using six of its nine open hearths at Massillon, O., and four of six open hearths and nine of 12 electric furnaces at Canton, O.

Timken Roller Bearing Co., Canton, stepping up its alloy production to 70 per cent, compared with 32 per cent of a few weeks ago, explained that the increase comes from orders for shipments to be made by Sept. 15, deadline for a steelworkers' strike.



Smoke Eliminator Developed

MARINETTE Marine Corp., Marinette, Wis., has developed a device to eliminate smoke and gas from boilers and furnaces. About 20 of the smoke eliminators will be made this year for companies in Chicago, Detroit and Cleveland.

Work on the pilot model now operating at Marinette was started about 16 months ago. The idea was that of Einar Hedin, a member of American Research & Development Corp., Boston, which financed the development and holds the patents. The device is based on the principle of rain, in which mist will turn into drops at the right temperature and at the right pressure, carrying foreign matter downward with it. In the present model, 200 cu ft of gas and fly ash a minute are sucked down from the burning material into a compression chamber. There, mist sprayed from nozzles is precipitated by hydrostatic pressure. The precipitation carries air-poisoning material with it into a sludge chamber. The sludge is then washed away.

Big Business

FTC reports steel among the industries having greatest economic concentration

PRIMARY steel is one of the nation's most concentrated industries, Federal Trade Commission reports in a special study for Congress on "Concentration of Productive Facilities."

Economic power in other industrial categories, notably primary aluminum production and tin can manufacture, is even more concentrated, but total size of these industries in net capital assets and production falls far below that of steel. Besides primary steel, the report covers virtually all major manufacturing fields. In metals this includes smelting and refining of copper, and production of aluminum, tin cans, agricultural machinery, electrical machinery, motor vehicles and office and store machinery.

U. S. Steel Largest—United States Steel Corp. owns 29 per cent of the steel industry's net capital assets, and Bethlehem Steel Corp., the second largest, holds 13 per cent. Relative sizes of leading companies are:

	Percent of primary steel industry's total	
	Net capital assets*	Ingot capacity†
United States Steel Corp.	28.6	35.2
Bethlehem Steel Corp.	13.4	13.5
Republic Steel Corp.	7.2	10.2
Jones & Laughlin Steel Corp.	5.3	5.3
National Steel Corp.	5.3	4.1
Armco Steel Corp.	3.6	3.4
Inland Steel Co.	3.0	3.6
Youngstown Sheet & Tube Co.	2.9	4.2
	69.3	79.5

* Year 1947. † Year 1945.

The commission emphasizes that its figures represent only the concentration of the total net capital assets of all corporations whose principal activity is steel production. This means that those productive facilities of the steel corporations which are actually engaged in other fields are also included in the steel industry. The commission does not believe, however, "that this factor results in any serious overstatement of concentration."

Corporate Intermingling—In the production of all nonferrous metals except aluminum, the commission notes a considerable degree of corporate intermingling. In the case of aluminum, the commission does not use net capital assets owned by the three major corporations as a measure of concentration. Such ownership is 82 per cent for Aluminum Co.

UNIVERSITY OF MICHIGAN LIBRARIES

of America, 16 per cent for Reynolds Metals Co. and 2 per cent for Permanente Metals Corp. "These are unrealistic figures," says the commission, in view of the importance of war-built plants now leased to Reynolds and Permanente and "the improbability" that these plants will come under Alcoa's ownership.

The commission finds that two corporations "virtually pre-empt" the tin can manufacturing industry. American Can Co. and Continental Can Co. together own 92.1 per cent of the total net capital assets in that industrial category.

Lakes Area To Get More Oil

GREAT LAKES Pipeline Co. will spend $37.5 million to boost supplies of burning oils in the Great Lakes area this winter. The company is owned by eight oil companies; ten other oil firms use its facilities.

Great Lakes now operates pipelines carrying oil products from Oklahoma and Kansas refineries to 14 delivery terminals in Kansas, Nebraska, South Dakota, North Dakota, Iowa, Minnesota and Illinois. New lines will be built along existing facilities running from Oklahoma and Kansas to the consuming areas.

Canadian Line May Be Extended

INTERPROVINCIAL Pipeline Co., a subsidiary of Imperial Oil Co. Ltd., plans to run its proposed Canadian crude oil pipeline further to Gretna, Man., very near the North Dakota border.

The company, now surveying the 450-mile route already approved from Edmonton, Alta., to Regina, Sask., is making application to the Board of Transport Commissioners for permission to build a line to Gretna.

Freight Car Fleet May Shrink

NATION'S freight car fleet may shrink slightly in the coming months although 280,960 new freight cars have been put on U. S. tracks in the last four years.

Arthur H. Gass, director of the Association of American Railroad's Car Service Division, reports that new cars are being installed by the railroads at the rate of 5000 a month—"with the likelihood of a drop"—while retirements of old cars are running at the rate of more than 6000 a month.

"The prospect for the remainder of 1949 and at least the early months of 1950 is for a natural and gradual decline in ownership following the pattern of railroad carloadings in recent months," Mr. Gass says.

MORE THAN six million tons of iron ore are transported up the Cuyahoga river in Cleveland each season past this Irishtown bend, one of the impediments to traffic which will be removed under a $21.9 million river development program

River Development: Spur to Industry

Community planning could increase metalworking concentration around steel mills. Obscure Truman-Hobbes Act may give impetus to trend

LONG-RANGE community planning in industrial centers may further the trend toward greater metalworking plant concentration near steel mills. The trend, already influenced by higher transportation costs and the shift to f.o.b. mill pricing, may get more impetus from the little-known Truman-Hobbes act which permits government financial aid in rebuilding bridges deemed a hazard to navigation.

Cleveland planners, for example, believe that speedier traffic on the kinky Cuyahoga river will enable steel companies to expand. This in turn will attract metalworking firms which seek closer steel supplies but which, in the case of Cleveland, hesitate to move where steel capacity would be inadequate for additional demand. Republic Steel Corp., Jones & Laughlin Steel Corp. and U. S. Steel's subsidiary, American Steel & Wire Co., all have plants along the Cuyahoga but have not expanded because of the river situation. All three own property along the stream where additional facilities could be erected.

Program Stalemated—Cleveland's program was stalemated by many drawbridges over the waterway which impede navigation. The Truman-Hobbes measure, passed when the President was a senator, was resurrected from oblivion and will be used for the first time in remodeling the Wheeling & Lake Erie Railroad bridge No. 25 over the Cuyahoga. Use of government funds under this act may have a profound influence on river and harbor development programs in other areas. The measure was enacted originally to modernize a bridge used by the Southern Railway in Alabama. Although the legislation was passed, it was never implemented by the Roosevelt administration. Only now is President Truman giving it administrative action.

Cleveland's general development program, started in 1937, has at least six years to go on the first phase which includes widening, deepening and remodeling bridges on the first five-and-a-half-mile stretch of the Cuyahoga. Designed to permit quicker navigation for vessels up to 600 feet in length, this phase of the project will cost $21,887,500 to finish. Expense will be borne by the city, county and federal governments, railroads and river-front property owners. Federal government's share is appropriated on an annual basis. Cleveland hopes to spend another $26.9 million extending the navigable

part of the river an additional three miles, but this will not be undertaken until the initial phase is completed.

Barium Buys Phoenix

Production will be resumed at iron works on Sept. 19 after being closed several months

BARIUM Steel Corp., New York, will purchase Phoenix Iron Co. and Phoenix Bridge Co., both plants being located in Phoenixville, Pa. Transaction is to be closed by the middle of September.

Announcement by the principals reveals Barium will pay about $2 million for Phoenix Iron Works but makes no mention of the price tag on the bridge corporation. A substantial down payment toward closing the deal has already been made by Barium.

Both plants, which normally employ 1200, have been closed several months. Rated capacity of the iron works is 20,000 ingot tons of steel monthly. Production is scheduled for resumption at the Phoenixville plant on Sept. 19.

Kaiser-Frazer bought the iron works from Phoenix-Apollo Steel Co. for $3.6 million in latter part of 1948. Included in the K-F purchase price were substantial inventories of steel products.

Barium Steel Corp. is a holding and management concern which owns, directly or indirectly, controlling interest in a number of metalworking and metalproducing subsidiaries. Sales of its 16 subsidiaries aggregated more than $51 million in 1948.

Scrap Seminar Attracts 240

ENROLLMENT at the first annual scrap seminar starting Aug. 28 at the Chicago campus of Northwestern University numbers about 240 with most of those attending being junior executives. Attendance at the first session is limited to employees or executives of active members of the Institute of Scrap Iron & Steel Inc. but, beginning next year, the institute hopes to include associate members, consumers and producers of scrap.

During the five-day session subjects covered will include: Functions of the scrap broker and dealer; metallurgical aspect of use of scrap in open-hearth and electric steel furnaces; inspection trip of a scrap yard and the Gary, Ind., plant of Carnegie-Illinois Steel Corp.; preparation of scrap; technique of demolition and recovery of scrap from slag dumps; scrap yard layout, engineering and materials handling; safety in scrap yards; transportation; and other allied topics. Certificates will be awarded by the institute to students who attend 9 of the 11 sessions on the curriculum.

GLEN E. COPELAND

Must Fight Air Pollution

NATION'S power plants—some 10,000 of them—must help clean up the atmosphere. Men who supervise and operate power facilities, meeting in Chicago last week for the 66th annual convention of the National Association of Power Engineers, heard warnings that combustion engineers must combat practices causing air pollution.

H. B. Lammers, director of engineering and chairman of the Coal Producers Committee for Smoke Abatement, said the individual engineer can fight pollution by: Improving equipment maintenance; improving supervision; adding equipment or replacing outmoded apparatus; increasing fuel efficiency; educating personnel; and keeping informed on developments in air pollution abatement.

Held in conjunction with the business sessions of the association was the National Power Show. More than 60 exhibitors displayed equipment.

Elected NAPE president was Glen E. Copeland, chief engineer, state capital buildings, St. Paul.

Conservation Problems Cited

LONG-RANGE conservation problems facing the steel industry of the U. S. were pointed out by Dr. Clyde Williams, director, Battelle Memorial Institute, Columbus, O., speaking before scientists attending the United Nations Scientific Conference on the Conservation and Utilization of Resources in Lake Success, N. Y. Conservation of steelmaking materials and greater utilization of existing plant capacity are of major importance to the U. S. economy because of: 1. Lack of some U. S. raw materials, 2. increasing scarcity of others and 3. mounting cost of plant replacement, Dr. Williams told the meeting.

As examples of technological developments, Dr. Williams cited: Sintering of fine ores, operation of blast furnaces under increased top gas pressure, use of oxygen in blast furnaces and open hearths, recovery of manganese and other alloying metals from open-hearth slags, utilization of low-grade manganese ores, development work being done on a basic side blown converter and continuous casting of semifinished steel.

Blast Furnace Output Slips

BLAST furnace production in July, at 4,173,311 net tons of pig iron, ferromanganese and spiegeleisen, dropped to 69.8 per cent of capacity, the lowest since April, 1948, when it was 69.4 per cent.

Figures compiled by the American Iron & Steel Institute show that blast furnace output for the first seven months of this year is still above that for the same period of 1948; 36,815,002 tons were turned out through July, 1949, compared with 33,861,473 tons in the corresponding months last year.

Blast Furnace Production
(In net tons)

Annual Blast Furnace Capacity..	70,541,850
Pig Iron Output	
July, 1949	4,126,597
First Seven Months, 1949.....	36,396,603
Ferromanganese, Spiegel Output	
July, 1949	46,714
First Seven Months, 1949.....	418,399
Total Output	
July, 1949	4,173,311
June, 1949	4,818,918
July, 1948	4,899,929
First Seven Months, 1949.....	36,815,002
First Seven Months, 1948.....	33,861,473
Per cent of Capacity	
July, 1949	69.8
First Seven Months, 1949....	89.8

Of the 37 companies operating blast furnaces, the nine firms in the South ran at the highest rate of capacity, 82.1 per cent, during July. The 17 companies in the Pittsburgh-Youngstown district operated at the lowest, 64.3 per cent.

CF & I To Open Rod Mill

COLORADO Fuel & Iron Corp. will celebrate the opening of its new rod mill at Pueblo, Colo., Sept. 12. Pueblo Chamber of Commerce will entertain guests with "an old-fashioned western barbecue" dinner.

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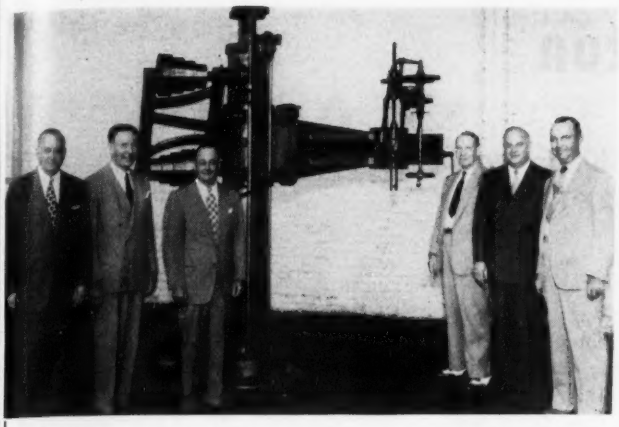
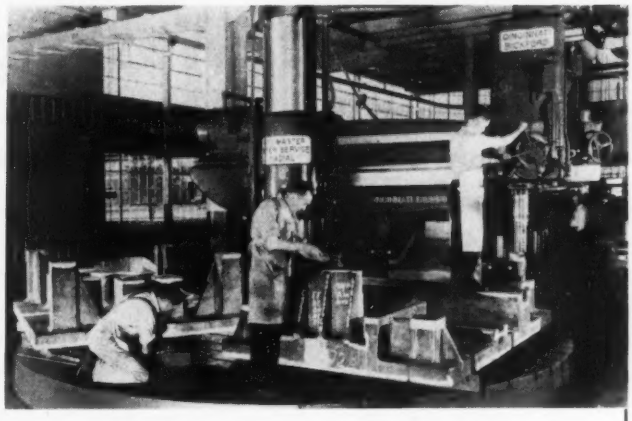




OLDTIMER: Despite its 75 years of age, this Cincinnati Bickford Tool Co. universal type radial drill is maintained in good condition. The Cincinnati firm is observing its three-quarters of a century anniversary. Present officers standing around the machine, which is a museum piece at the company's Oakley plant, are (left to right): L. Lee Schauer, vice president and chief engineer; Paul E. Heckel, secretary; Neil C. Schauer, vice president and sales manager; George P. Gradolf, chairman of the board and treasurer; Ozni E. Schauer, president and general manager; and C. Charlton Slete, assistant treasurer. At right is a modern radial drill built by the company and in operation in the tool room of a large automobile manufacturer

Sales Effort Stepped Up

By machine tool builders to woo bashful buyers. Merchandising techniques revitalized

MERCHANDISING techniques similar to those used successfully by manufacturers of consumer goods are getting favorable attention from machine tool builders. On-the-premise showrooms are becoming more numerous and new developments are introduced with showmanship formerly reserved for consumer goods.

Among the companies using the showroom technique for exhibiting their wares in an eye catching manner are: Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford, Conn.; Jones & Lamson Machine Co., Springfield, Vt.; Sheffield Corp., Dayton, O.; Monarch Machine Tool Co., Sidney, O.; Kearney & Trecker, Milwaukee; Landis Tool Co., Waynesboro, Pa.; and Cincinnati Milling Machine Co., Cincinnati. Warner & Swasey Co., Cleveland, maintains a department equipped with their newest model turret lathes to show prospective customers.

Rent with Option To Buy—DoAll Co., Des Plaines, Ill., is having considerable success with a plan under which its equipment may be rented with an option to purchase. This method is particularly successful in dealing with small machine shops, conspicuous by their absence from machine tool marts.

To these small operators the expenditure of several thousand dollars looms very large at a time when they have doubts and fears about their business future. They prefer to rent machines and keep their limited capital free for emergencies. Volume of business resulting from rental deals does not add up to a large percentage of the total, but when added on top of the usual business it does boost the operating rate.

The large attendance and the interest shown in the four sessions of the sales refresher course conducted during the summer under the joint sponsorship of the National Machine Tool Builders' Association and the American Machine Tool Distributors Association points up the interest in greater sales effort.

Sales Lag—Dealers report the hoped for upswing in business has not yet materialized. Most machine tools can be supplied out of stock. In the event that modifications are desired on standard models, up to four weeks may be required to make the desired changes.

Used machinery sales are also slow. With the exception of radial drills, which are in shortest supply, dealers have ample quantities on hand. The absence of war surplus machines from the market in the last few months is regarded as an encouraging fact. Firms engaged in rebuilding and reconditioning say that most machine tools being offered for sale are "war wearies" with few good items available. The expense involved in rebuilding worn out equipment for resale makes most of these machines poor buys.

July Tool Orders Fall

Drop in new orders for machine tools continued in July and set a postwar low for the second consecutive month. The new orders index of the National Machine Tool Builders' Association fell to 48 from 53.6 in June and 74 in July, 1948. Foreign orders were down to 14.2 from 15.7 in June but above last July's 13.3.

Shipments also dipped to a postwar low of 60.8 in July, compared with 79 in the preceding month and 62.4 in the corresponding month a year ago. The sharp drop in shipments raised the ratio of unfilled orders to shipments to 4.4:1 from 3.5:1 a month earlier.

Association's indexes are based on average monthly shipments in 1945-1947 equaling 100. Average annual shipments in the base period were $355 million.

Distributor Selling Increases

MARKETING programs of many manufacturers of industrial supplies and machinery are being changed from direct selling to handling their sales through industrial supply distributors. Carl J. Meister, general sales manager, Atlas Chain & Mfg. Co., Philadelphia, says this fact was revealed in a survey of the $3 billion industrial supply industry.

Reason for the change, Mr. Meister points out, is manufacturers are critically appraising distribution costs for ways and means of economizing and are finding that distributors serve industry more economically. Manufacturers find this method helps eliminate the small order problem and customers do not have to carry inventories of slow moving stocks. Purchasers also can get better sales service as the training of distributors' salesmen rises to the level of the manufacturers' salesmen. Distributors' salesmen are more readily available for consultation.

Windows of Washington

Voluntary allocations program ends Sept. 30, to finish a 21-month career. Fifteen projects, taking 242,912 tons of steel, will be continued until the last

VOLUNTARY allocations program expires Sept. 30, to end a hectic 21-month career. On Dec. 30, 1947, President Truman signed Public Law 395, the anti-inflation act which, among other provisions, enabled setting up the Office of Industry Cooperation in the Commerce Department to administer voluntary allocations of steel and pig iron.

When appropriations were under consideration for the current fiscal year, OIC Director Earl W. Clark made no recommendations that his agency be continued after the legal Sept. 30 closing date since the supply and demand situation has completely changed in the past 21 months. In commenting on the "splendid co-operation" given by the steel companies, Mr. Clark told STEEL that the project presented "an excellent demonstration of how government and industry can plan a program and carry it out."

Programs Continued—Fifteen voluntary plans, requiring 242,912 tons of steel, will be continued through September. Last April and May the peak amount of steel, 581,233 tons, was being allotted. Highest tonnage of pig iron, 106,830, was allocated in the fall of 1948. A total of 19 steel and pig iron programs have been administered by OIC over 21 months. OIC personnel have numbered as many as 133, but only three or four will still be on hand Sept. 30. The number of producers engaged in the programs ranged from two for an Atomic Energy Commission gas pipeline to 68 supplying requirements for the armed services.

The 15 purposes for which steel is still being allocated are: Warm air heating equipment for residential housing; AEC projects; armed service requirements; tank and oil field production equipment; freight-carrying barges and towing vessels; the anthracite industry; oil tankers; requirements for federal aeronautical agencies; construction, reconversion and repair of merchant vessels; mining machinery; AEC's gas pipeline; grain storage bins; ECA countries; federal reclamation projects; and baseboard radiation.

Four Programs Lapse or End—Four other programs have been discontinued or allowed to lapse subject to reinstatement if necessary. The two programs completed supplied steel for ore car manufacture and prefabricated houses. Two industries have requested that their allocations be discontinued, although subject to review; freight car builders can get all the steel they need and cast iron is adequate for residential housing requirements.

John C. Virden, a Cleveland industrialist, was the first head of the OIC. He was succeeded in the fall of 1948 by Mr. Clark. OIC was and still is assisted by the Steel Producers Advisory Committee, an organization of 23 industry executives. Mechanics of the program were modeled after those previously set up to allocate steel to the freight car builders. This project was taken over and the first to be administered by OIC. Public Law 395 originally provided that the agency close Feb. 15, 1949, but Congress extended its life to Sept. 30.

Pickup in Orders Noted

APPRAISING the business outlook, Commerce Department says business conditions will be satisfactory if demand stays where it was at midyear. Looking back at past performance, it reveals a pickup of 8 per cent in new orders placed with manufacturers in May and June.

Increase in new orders was hailed as the first significant break in the downtrend that started last fall. "The rise affected nearly all industries, and in some—such as cotton textile—new orders exceeded the level of output by an appreciable margin," the department says, but added: "The aggregate flow of new business has remained low in relation to both output and final consumption notwithstanding the recent modest advance."

The only major downward movements that continued in the second quarter, says the department, were in manufacturing production, employment and payrolls. These declines it blamed on business meeting part of demand out of inventory instead of current production.

Heating Unit Shipments Rise

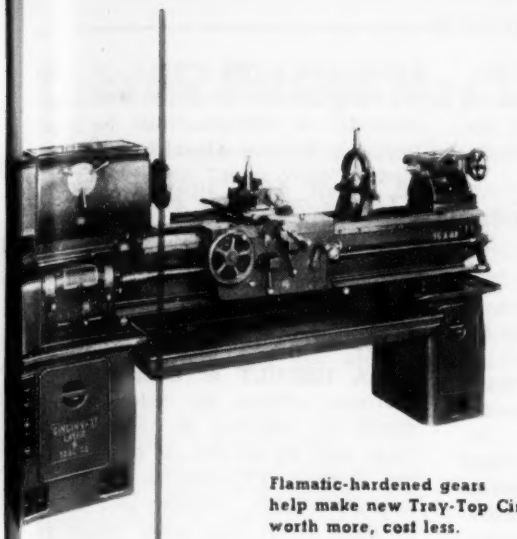
SHIPMENTS of all types of heating and domestic cooking equipment in June increased over May, Census Bureau reports.

June shipments of cast iron boilers amounted to 13.1 million pounds valued at $2.7 million—an increase of 54 per cent over the 8.5 million pounds shipped in May. Shipments of 2.2 million square feet of cast iron radiation in June were 47 per cent above May shipments. June shipments of 46,900 oil burners and burner units was a substantial increase over May's 34,900.

Shipments of warm air furnaces also increased significantly from 42,400 units in May to 55,300 in June. June shipments of floor and wall furnaces were 24,600 as compared with 19,200 units in May.

Domestic heating stoves showed an increase of 88 per cent in June: 187,400 units were shipped then; in May 99,700 units were shipped. June shipments of water heaters (except electric) increased to 166,100 units val-

NO 5 PER CENTERS: F. F. Wilcox, a section chief in the Army Ordnance Office, examines a sample of continuous cast bronze, product of American Smelting & Refining Co., Barber, N. J. R. W. Bailey, one of the first visitors to the Military Procurement Office set up by the National Military Establishment, was directed to the proper agency. NEA Photo

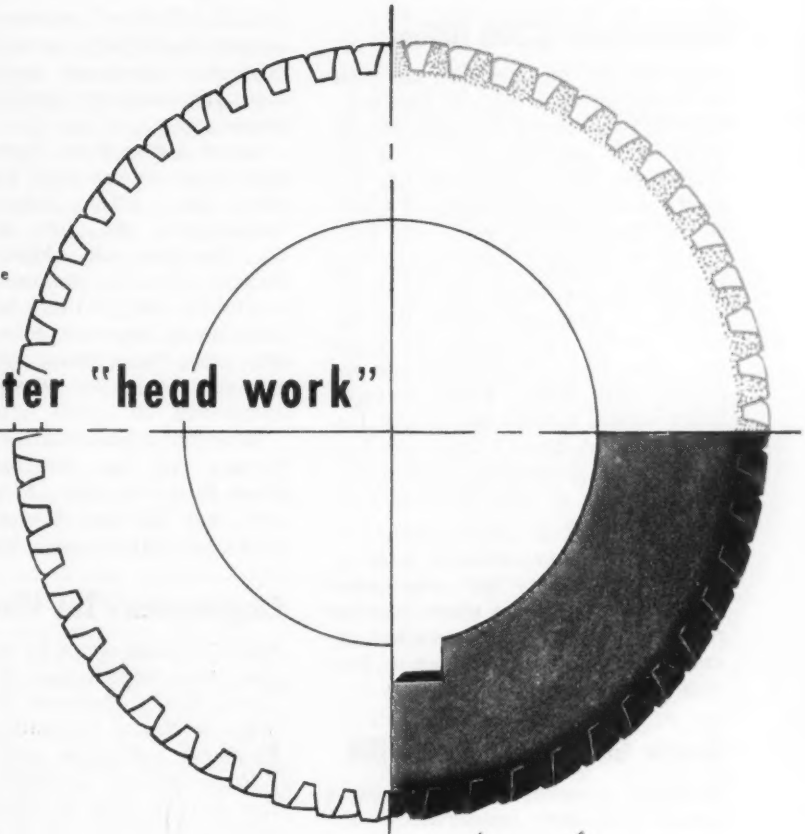


Flamatic-hardened gears help make new Tray-Top Cintilathe worth more, cost less.

gears hardened for better "head work"

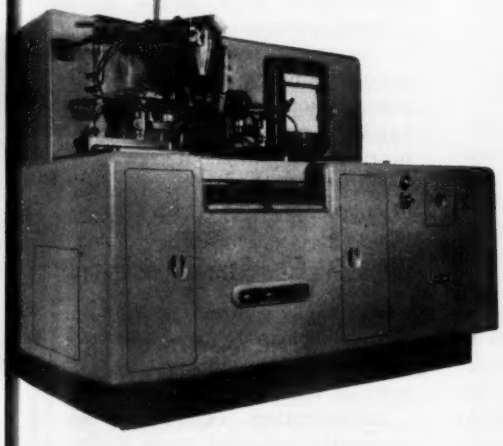
specified

Surface hardness, gradient, and depth held uniformly to predetermined values, as shown by etched section



achieved

Maximum service life, hard, long-wearing surfaces, tough cores, smooth operation and lowest processing cost in lathe transmission gears



More lathe for less money in every detail was written into the specifications of the Cincinnati Lathe & Tool Co.'s new economy-priced Tray-Top Cintilathe, a requirement that Flamatic-hardened transmission gears helped to achieve. First, the desired hardness patterns in the gears (for headstock, quick change gear box and apron) were literally **blueprinted** and optimum values for surface hardness were established. Flamatic proved that these specs could be held, right on the button, each gear—indeed each tooth—being **uniform** and **uniformly** good. Stock: SAE 3150; surface hardness: RC 52 to 58; production rate on 4" OD, 3¼" face, spindle helical gears: 180/hour.

Flamatic's exclusive electronic temperature control plus high temperature flames permit rapid heating of surfaces to within plus or minus 10°F. prior to oil quench. Gears up to 18" OD, shafts up to 24" long, cams, and similar parts are all within Flamatic's wide range of application. Investigate now Flamatic's ability to put **more value for less money** into your products. Write for booklet of case histories: Publication M-1658, or send us a part print for recommendations.

flamatic

THE CINCINNATI MILLING MACHINE CO.

Cincinnati 9, Ohio, U.S.A. • CINCINNATI

ued at $7.8 million; May shipments were 150,100 units. Shipments of domestic cooking stoves (except electric) showed an increase of 6 per cent in June from 177,300 units in May to 187,100 in June.

Incomes Total $206 Billion

INDIVIDUAL incomes rose last year to a new all time high of $206,011,000,000, Department of Commerce reports. The national total was 9 per cent over 1947. The national per capita income in 1948 averaged $1410, an increase of 7 per cent over 1947.

New York state, with $1891, had the highest per capita income in the nation, 34 per cent above the national average and a rise of 9 per cent over 1947. Mississippi had the lowest, with $758. Every state in union except Kansas and North Dakota, which declined 1 and 4 per cent respectively, showed an increase during the year in total individual income payments.

Largest regional gain in total income from 1947 to 1948 was scored by the Central States where incomes rose 12 per cent. The smallest increases, 6 per cent, occurred in New England and the Far West.

Senate Gets Mine Subsidy Bill

SENATE Interior & Insular Affairs Committee has unanimously approved a mine incentives bill which has administration backing.

The measure now goes to the Senate floor. Committee chairman Joseph C. O'Mahoney (Dem., Wyo.), who introduced the bill, thinks its prospects for final passage at this session of Congress are "very good."

The O'Mahoney bill would set up a new minerals conservation board headed by the secretary of interior. This board's function would be to promote exploration for and conservation of minerals and metals. The bill itself places no limitation on the cost of operating the program. It merely authorizes the appropriation of "such sums as may be necessary" to carry out the act.

The conservation board would promote exploration by sharing in the cost of exploration projects. The board would be empowered to promote conservation by participating in the cost of maintaining a mining property in stand-by condition or by purchasing all or any part of the metals or minerals resulting from production at such a deposit.

If the measure becomes law this year, government contracts could be made and renewed to run for as long as the fall of 1954. The Munitions Board, government stockpiling agency, would be given first choice to buy any metals or minerals acquired under the program, but it would not be required to purchase any of them.

Contract Awards for Grain Bins

TABULATION of contracts by Commodity Credit Corp. for movable type steel and aluminum grain bins to store this summer's surplus crop includes:

Great Lakes Steel Corp., Detroit, 2300 bins; Butler Mfg. Co., Kansas City, Mo., 3235; Allison & Co., Bloomington, Ill., 100; Kilby Steel Co., Anniston, Ala., 2000; American Bantam Car Co., Butler, Pa., 1500; Litchfield Mfg. Co., Minneapolis, 400; James Mfg. Co., Fort Atkinson, Wis., 250; Eaton Metal Products Co., Omaha, Nebr., 75; Blaw-Knox Co., Pittsburgh, 10.

Aluminum bins: Butler Mfg. Co., Kansas City, Mo., 300 bins; Martin Steel Products Corp., Mansfield, O., 120; and Midwest Aluminum Products Corp., Minneapolis, 500 bins.

Congressmen's Tax Views Differ

EXCISE taxes won't be reduced this year, says Rep. Robert L. Doughton (Dem., N. C.), chairman of the House Ways & Means Committee in which all money legislation must originate.

Representative Doughton estimates that in fiscal 1950 the deficit will run between $4 billion and $5 billion. His views on taxes differ from those of Sen. Walter F. George (Dem., Ga.), chairman of the Senate Finance Committee which handles tax legislation. The senator has called for a downward revision of individual income taxes, elimination of wartime excise taxes and a possible increase in levies on corporations.

Taconite Development Urged

EYEING American millions going into foreign development and rebuilding of all kinds, proponents of the exploitation of low-grade iron ores in Minnesota are drawing comparisons between this open-handedness and their own situation.

"Government funds for development in foreign countries seem to be obtainable in some instances under very favorable terms," comments Dr. E. W. Davis, director of University of Minnesota's mine experiment station, in a letter to Sen. Hubert H. Humphrey (Dem., Minn.). "I believe that funds for development of domestic resources should be made available under terms that are at least as favorable."

In order to maintain iron and steel production at present levels for any considerable period of time—10 years or more—new sources of iron ore—domestic or foreign—must be made available to the American steel industry "quite soon," he added.

Legislation on the subject will be sought by Senator Humphrey as a part of the proposed "Economic Expansion Bill of 1949."

Cities Work on Trade Fair Plans

AS A RESULT of Commerce Department efforts six cities are engaged in planning an international trade fair as an annual event. They are Detroit, Philadelphia, Washington, New York, Chicago and Atlantic City, N. J. Two other cities, Atlanta and Dallas, have expressed interest in holding annual international fairs.

Commerce Department went on record two years ago as recognizing the importance of international fairs in promoting world trade. It has been recommending their establishment in the U. S. ever since. Paul G. Hoffman, administrator of the Economic Cooperation Administration, says the Organization for European Economic Cooperation, too, is exploring possibilities of holding such fairs in the U. S.

AEC Starts Information Program

ATOMIC ENERGY Commission is starting a trial program to make technological information available to American industry. To assist in developing the program, a temporary advisory committee of representatives of professional societies and business papers has been appointed. Included among members of this committee is STEEL's Washington editor, E. C. Kreutzberg.

Chief purpose of the program is to determine the possibility of providing industry information about pumps, blowers, valves, techniques of handling materials and other metallurgical data without revealing importance of the information to the atomic energy program.

Cleaning Rod Standards Proposed

PROPOSED commercial standard for firearms cleaning rods has been circulated in the industry by the Bureau of Standards.

Representing composite industry proposals, principal items covered are sizes of tip threads to facilitate interchangeability of cleaning attachments and certain refinements in the rods to preclude abrasive action in firearms barrels. Manufacturers would be entitled to carry a text to the effect that products complied with such standards.

UNIVERSITY OF MICHIGAN LIBRARIES

Economic Parleys May Ease U. K.'s Plight

Washington conferences beginning Sept. 6 and Sept. 13 will deal with trade and monetary matters. Cripps and Bevin will head British delegation

TWO economic parleys in Washington—beginning on Sept. 6 and Sept. 13—will focus attention on the plight of Great Britain and the sterling area.

The first and most significant meeting from the standpoint of the success of the Marshall Plan will be the Anglo-Canadian-American economic conference. Sir Stafford Cripps, chancellor of the exchequer, and Ernest Bevin, foreign minister, will be there for the British. U.S. Secretary of the Treasury John W. Snyder will preside over the discussions. The second conference will be the annual meeting of the International Bank for Reconstruction & Development and the International Monetary Fund.

For the Sept. 6 gathering the British delegation is expected to:

1. Discuss methods for expanding British exports to the United States and Canada.

2. Talk about methods of paring dollar expenditures through reduction of British imports from the U.S. and Canada.

3. Think up ways of encouraging American capital investment in the sterling area.

On item 1, the British will outline what they have done to increase production, reduce prices and promote sales of British products in the U.S. They will explore chances for stabilizing prices. They will urge the U.S. to cut tariffs and will ask the U.S. to stockpile tin, rubber, jute and wool, sales of which are falling off.

On item 2, the British will point out they have already cut imports from North America to the bare minimum.

On item 3, they may offer some concessions to attract American capital investment. The U.S. has asked Britain to reduce state trading, ease its exchange controls and halt bilateral barter deals. The U.S. also wants Britain to devalue the pound, but the British want the U.S. to raise the price of gold in a move to accelerate world trade. These last two proposals, also to be aired at the monetary conference beginning Sept. 13, probably will get nowhere.

U. K. Bankrupt by Christmas?

British fear that the continuing rapid decline of gold and dollar reserves will bankrupt the nation by Christmas.

Although production is still inching upward, so are prices. The index of retail prices rose from 109 (June, 1947=100) at the end of 1948 to 111 in June, and food prices moved from 108 to 115. Maximum prices of utility footwear, clothing and household textiles are to be reduced by about 5 per cent early in September. Some prices on consumer goods have already been ordered reduced at retail levels. The U.K. Board of Trade fears that high prices are weakening the wage stabilization policy. The index of weekly wage rates remained at 108 (June, 1947=100) throughout the first six months of this year.

Steel production in July was affected by the normal vacations in the industry. The annual rate of 13,964,500 net tons of ingots and castings achieved in July compares with a rate of 13,292,400 tons a year ago.

British shipyards at the end of June were building 397 ships totaling 2,043,000 tons, or 33,000 tons less than in the previous quarter. Tonnage under construction in foreign yards increased, and British builders accounted for 45.9 per cent of world construction in the June quarter against 47.8 per cent in the March quarter. About 37 per cent of the total tonnage in British yards is for export, the biggest customers being Norway and Argentina.

Canada Stems Dollar Drain

Increased restrictions on Canadian imports from the United States loom as Ottawa officials study ways of saving more U.S. dollars.

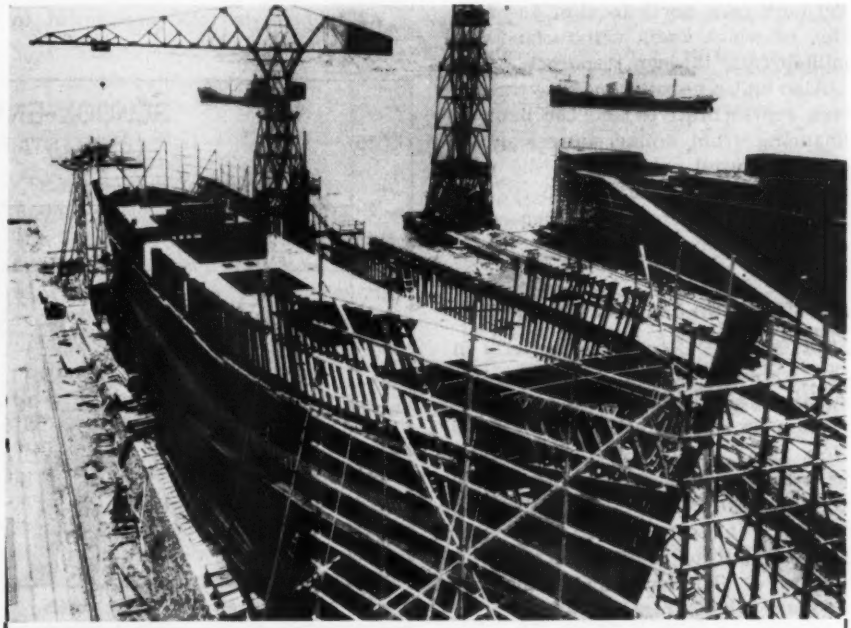
The measures taken by Canada late in 1947 to stem the loss of American dollars were so effective that some of the curbs against U.S. goods were modified earlier this year. These restrictions will probably be reimposed, and new regulations on imports may be placed on products not previously controlled. These include primary iron and steel, chemicals, farm machinery and oil.

There has been a steady drain on the dominion's American dollar holdings, although its position still is much better than at the time of the dollar-shortage crisis in 1947.

Australia Cuts U. S. Imports

Great Britain's request to her dominions to cut dollar purchases by 25 per cent will reduce Australia's imports of American machinery. The dominion's program to develop open cut mining, roads and a billion dollar hydroelectric program will be curtailed but not stopped.

Australia will go to Britain for farm tractors normally imported from the U.S. Gasoline, tobacco, newsprint and textiles usually pro-



INTERNATIONAL: General view of Mitsui Shipbuilding & Engineering Co., Tamano, Japan, where three 5170 deadweight ton cargo ships are under construction for the Danish shipbuilding firm of A. P. Moeller. First of three ships to be launched is at right background; a second vessel is in foreground

cured in America will come from the sterling area.

The dominion is restudying its dollar-earning industries. Lead mines in Western Australia, for example, are being re-examined for ways to increase the already substantial exports to the U. S. Mines in the northwest are now closed because they are uneconomical, but a survey of new mining methods may reveal that these properties can be reopened.

End of the seven-weeks' coal strike permits near capacity operations in the steel industry again. Another bottleneck, the labor shortage, is also being surmounted with the use of displaced Europeans who have had steel industry experience. The dominion immigration laws have been relaxed to permit this class to enter the country. A steel shortage still exists in Australia; the situation has been partly met by heavy imports from Great Britain.

India Changes Import Policy

Although India has also agreed to reduce her imports from hard currency areas by 25 per cent, dollar purchases financed by loans from the International Bank for Reconstruction & Development will be excluded from the agreement.

In its first loan to a member country in Asia, International Bank has authorized $34 million to India for rehabilitation and modernization of the country's state railways. Included in the program will be importation of 653 locomotives with spare boilers, locomotive spare parts and 350 tank cars, for a total of $84 million, of which India will furnish $50 million from its own resources.

Also under negotiation between Indian representatives and the bank is financing from dollar sources of an electric power project and the purchase of agricultural machinery. The bank's loans to India will soon reach about $75 million.

Air Pollution Conference Slated

NATION-WIDE scientific activity in the field of air pollution has grown to such magnitude that a national symposium on air pollution will be held Nov. 10-11 at the Huntington Hotel in Pasadena, Calif. Sponsor of the conference will be Stanford Research Institute in co-operation with California Institute of Technology, University of California and University of Southern California.

Subjects to be discussed at the meeting include: Influence on industrial planning and plant location, reduction or elimination of air pollution at its source, methods of sampling and analysis and meterological aspects.

Schools: Steel Users

Metalworking industry seeks educational business as enrollment gains sharply

METALWORKING industry will be going to schools—to get business—on an increasing scale over the next eight years.

An enrollment growth, already underway, promises to push school attendance 32 per cent above the 1949 level by 1958. U. S. Bureau of the Census says expansion in schools will be necessary up to 1957.

Where the expansion requires new buildings or additions there will be a demand for structural steel, hardware, and plumbing, heating, ventilating and lighting equipment. Whether the expansion requires new construction or is handled by crowding existing facilities, it will generate demand for such products of the metalworking industry as lockers, seats and desks, typewriters, and school busses.

How They Grow—Census Bureau's forecast of elementary and high school enrollment, with 1947 and 1948 figures for comparison, follows:

(000 omitted)

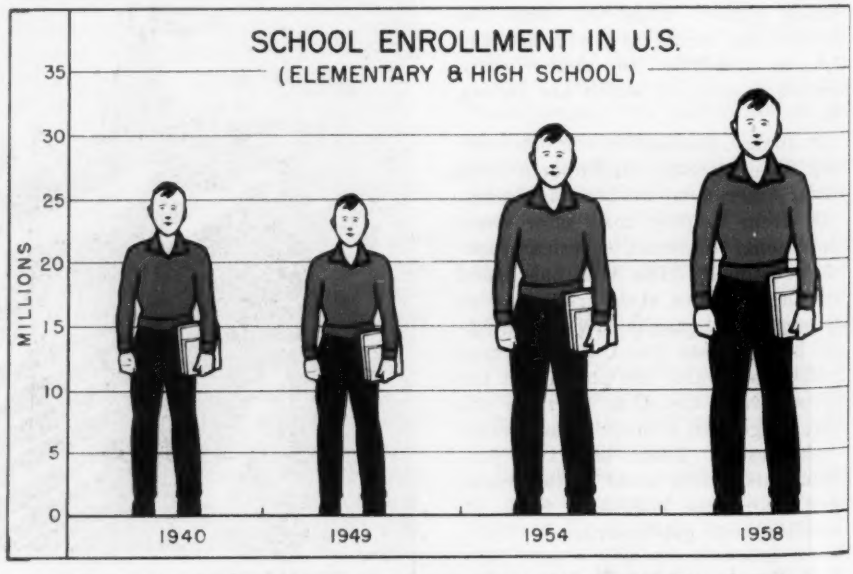
1947	24,546	1954	31,055
1948	25,007	1955	32,205
1949	25,798	1956	33,065
1950	26,635	1957	33,704
1951	27,414	1958	34,104
1952	28,217	1959	34,046
1953	29,622	1960	34,091

While peak in total enrollment in the nation's public and private schools is expected to come in 1958 the high point in elementary school registration is anticipated in 1957, the Census Bureau says. In that year the enrollment in grades 1 through 8 would reach 26½ million, exceeding the 1949 enrollment by more than 7 million children, or 38 per cent.

High school enrollment, the Census Bureau states, is expected to decline slightly until 1951 and then to increase rapidly and reach 8 million by 1960. The 1960 high school enrollment would be greater than the 1949 figure by almost 2 million, or 30 per cent. After 1956 the increase in high school enrollments will parallel the upward trend forecast for elementary schools in earlier years.

Five for Three — The Census Bureau points out that for every three eighth-grade seats needed now, five will be required in 1960, and that facilities now available for every two pupils in fourth-year high school classes will have to be expanded to accommodate three pupils by 1960.

Although the changes in both elementary and high school enrollments are largely attributable to fluctuations in the birth rate, other factors are involved. One of fundamental importance, says the Census Bureau, is extent of change in rates of enrollment by age. In the last two decades these rates have risen gradually and, on the whole, continuously. Compulsory attendance laws have been enacted in every state, and their strict enforcement has increased the rate of attendance among children.



GROWTH of opportunity for sales of steel and metalworking products to schools is depicted in this chart which shows how the number of pupils will increase, necessitating an expansion of facilities. By 1954, total enrollment in public and private elementary and high schools in the U. S. will be 31,055,000, compared with 25,798,000 in 1949 and 27,484,000 in 1940. Peak will be 34,104,000 in 1958

Export Business Good

Three-way barter system helps swell Dresser Industries total. Orders may reach $10 million

EXPORT orders totaling at least $7 million and which may run as high as $10 million from Argentina, Turkey, Yugoslavia and Italy have been booked by Dresser Industries Inc., Cleveland, builder of oil and gas producing equipment.

An innovation in the Argentine sales was the conclusion of a three-way agreement whereby Argentine wools, hides and tanning extracts sold to Europe provide the means of payment. J. B. O'Connor, executive vice president of the company, calls this a modern adaptation of the old-fashioned barter system. He adds, "In my opinion, million of dollars worth of American business is waiting for companies who negotiate such three-way deals involving raw materials, finished goods and dollars."

Dresser products sold to Argentina include equipment for the drilling of new wells and rehabilitation of existing wells. Dresser companies participating are: Clark Bros. Co. Inc., supplying compressors and pumps; International Derrick & Equipment Co., drilling rigs and rotary oil field equipment; Pacific Pumps Inc., pumps for rehabilitation of present wells; and Security Engineering Co. Inc., drilling bits. Roots-Connersville Blower Corp., another Dresser company, is installing positive gas boosters to improve the gas supply of Buenos Aires.

The company has completed shipment of several drilling rigs to the Adana Basin in Turkey and is shipping producing equipment to the new Raman dag Field. Gas pumping equipment unit originally on display at the Padova Fair in Italy, plus several additional units have been purchased for installation in the Po river valley to help supply natural gas to Italian industries. The Yugoslavia program includes rehabilitation of old wells and deeper drilling to promising new levels.

Metalworking Manual Issued

COLLABORATION of more than 250 production engineers in leading American industries has resulted in a comprehensive manual on metalworking production. Sponsored by American Society of Tool Engineers, Detroit, the basic metalworking reference took seven years of preparation and an investment of $150,000 by the society.

R. B. Douglas, president of ASTE, describes it as a handbook on "the art of making things economically." It is in indexed form and has more than 2000 illustrations.

Subjects included in the manual, says Editor Frank W. Wilson, are: planning and control of production; materials and machinability; casting and extruding operations; metal cutting, grinding and finishing; metal forming; surface finish and protective coatings; gaging and inspection; fixture, tool and die design; and machine tool controls and feeding devices.

Radar School To Be Held Again

SUCCESS of the first Radar School sponsored by Lake Carriers' Association in Cleveland last winter and rapid increase in radar installation is prompting the association to run another school this year.

Gerald S. Wellman, vice president of the association, supervising school activities, says fleet operators are convinced of the importance of continuing the school and making instruction available to as many additional officers as possible.

Educational Program Expanded

FOUNDRY industry's Foundry Educational Foundation which conducts a college-level educational program in seven colleges, will add five more engineering schools to its list in May, 1950.

Expanded program calls for expenditure of $400,000 on scholarships and aid to universities in 1950, 1951 and 1952. Foundation invites foundry members, equipment manufacturers and suppliers throughout the country to participate in the campaign beginning in late September, says Stowell C. Wasson, president.

Educational foundation's founding members are: Steel Founders Society, Malleable Founders Society, Gray Iron Founders Society, Non Ferrous Founders Society, American Foundrymens' Society and Foundry Equipment Manufacturers Association.

"Lend-Lease" of Professors

"SOMETHING like a lend-lease program" is the comment made by H. N. Muller, manager of Westinghouse Educational Department, about the 17 professors from as many different institutions who spent their summer working with men and women making electrical apparatus in Westinghouse plants.

"The colleges lend professors; Westinghouse gives them practical training; and, in return, Westinghouse gets better engineers when students graduate," says Mr. Muller. Professors, all of whom were paid regular salaries by the company, had their work arranged so they could specialize in subjects they teach while they got an overall view of company operations.

CALENDAR OF MEETINGS

Sept. 9-12, Instrument Society of America: Clinic on maintenance of industrial instruments, Hotel Statler, St. Louis. Society headquarters are at 921 Ridge Ave., Pittsburgh.

Sept. 12-16, Instrument Society of America: National conference and exhibit, Municipal Auditorium, St. Louis. Society headquarters are at 921 Ridge Ave., Pittsburgh.

Sept. 12-16, National Association of Corrosion Engineers: Short course in corrosion at University of Texas, Austin. Association headquarters are at 919 Milam Bldg., Houston.

Sept. 14-16, Porcelain Enamel Institute: 11th annual forum, Ohio State University, Columbus, O. Institute headquarters are at 1010 Vermont Ave. N.W., Washington.

Sept. 15-16, Associated Industries of Cleveland: Fall clinic on industrial relations, Carter Hotel, Cleveland. Group's headquarters are in the N.B.C. Bldg., Cleveland.

Sept. 18-21, American Chemical Society: 116th National meeting, featuring a symposium on titanium, Atlantic City, N. J. Society headquarters are at 60 E. 42nd St., New York.

Sept. 21-24, National Association of Foremen: 26th convention, Hotel Statler and Masonic Temple, Detroit. Association headquarters are at 321 W. First St., Dayton, O.

Sept. 25-Oct. 1, American Institute of Mining & Metallurgical Engineers: Midyear meeting, Neil House, Columbus, O. Details may be obtained from J. H. Melvin, Orton Hall, Ohio State University, Columbus, O.

Sept. 26-28, National Electronics Conference: 1949 conference and exhibit sponsored by Illinois Institute of Technology, Edgewater Beach Hotel, Chicago. Nathan Cohn, Room 1505, 307 N. Michigan Ave., Chicago, heads the exhibit committee.

Sept. 26-28, American Mining Congress: Metal Mining Convention, Spokane, Wash. Congress headquarters are in the Ring Bldg., Washington.

Sept. 26-28, American Management Association: Personnel conference, Waldorf-Astoria Hotel, New York. Association headquarters are at 330 W. 42nd St., New York.

Sept. 27-30, American Society of Mechanical Engineers: Fall meeting, Hotel Lawrence, Erie, Pa. Society headquarters are at 29 W. 39th St., New York.

Sept. 29, American Iron & Steel Institute: Regional technical meeting, Hotel Statler, Buffalo.

Oct. 3-4, National Association of Corrosion Engineers: South central regional meeting, Adolphus Hotel, Dallas. Heading the arrangement committee is G. R. Olson, United Gas Pipe Line Co., Shreveport, La.

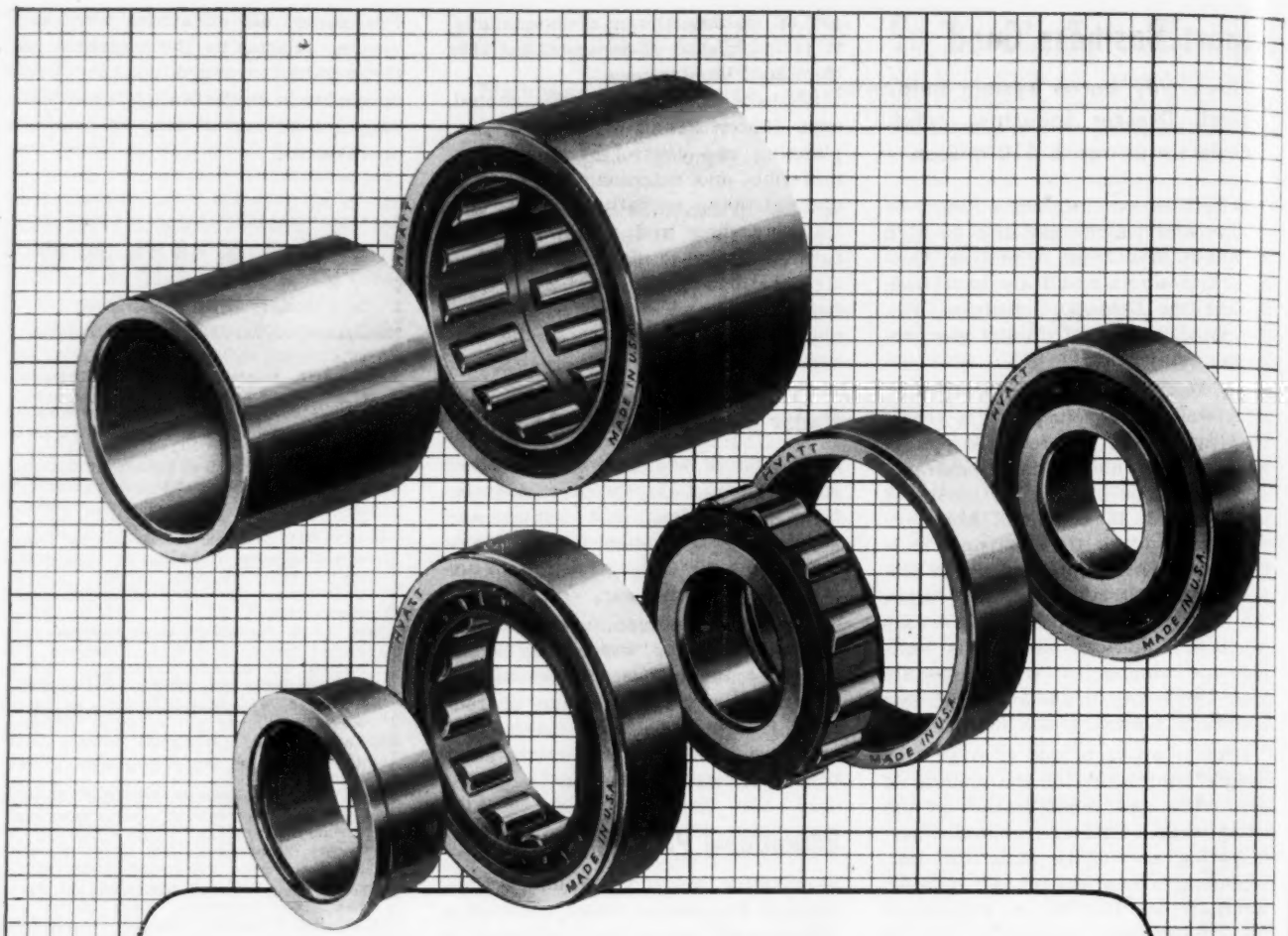
Oct. 3-5, American Coke & Coal Chemicals Institute: Annual meeting, Skytop Lodge, Skytop, Pa. Institute headquarters are at 129 15th St., Washington.

Oct. 3-6, Association of Iron & Steel Engineers: Annual convention, William Penn Hotel, Pittsburgh. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

Oct. 4-6, Society of Industrial Packaging & Materials Handling Engineers: Fourth annual exposition, Detroit.

Oct. 6, American Iron & Steel Institute: Regional technical meeting, Drake Hotel, Chicago.

Oct. 10-11, Boston Conference on Distribution: 21st annual affair, sponsored by Boston Chamber of Commerce, Harvard University, Boston University and others.



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HYATT ROLLER BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

New Ford plant at Buffalo raises speculation as to closer tie-in between automaker and Bethlehem Steel. Latter may eventually take over Rouge steel plant

DETROIT

ALTHOUGH full production is still some two years away, the new Ford pressed steel plant in the Buffalo area at the back door of Bethlehem Steel Co.'s Lackawanna plant has interesting connotations for the future of both the Ford Rouge and company operations in general. In the first place, it is in line with plans for decentralization of the Rouge which the new management at Ford started to draw up when it took over following the war. One of the first long-range projects was the pressed steel operation and there was talk of removing much of the stamping work being done at the Rouge to outside areas. Now, however, it appears there will be little change in these facilities at Dearborn, but a large volume of work now being placed on the outside will later be divided between the Rouge and Buffalo plants. Murray and Budd will be the principal losers, although there are a number of other smaller stamping suppliers who stand to be cut off from Ford business. About half of total stamping requirements currently are purchased from outside sources, in two years only 10-15 per cent will come from these vendors.

Bethlehem Expands—Another significant angle to the new Ford project is the closer tie-up it establishes between Ford and Bethlehem Steel. The latter company is spending $20 million or more in extending its sheet and strip rolling facilities at Lackawanna to handle expected Ford requirements and it is likely that practically all production steel needs can be accommodated by Bethlehem, with virtually no shipping expense involved because of the proximity of the two Buffalo plants.

Meanwhile, at Dearborn the large Ford open-hearth and steel rolling facilities with annual capacity of close to a million tons of ingots supply about half of the total steel requirements of the fabricating divisions. The Ford management has been giving serious consideration to eventual disposition of its steel division at the Rouge, so that it could concentrate exclusively on manufacture of cars, trucks and related products. The buyer logically would be one of the leading steel mills and you do not have to look much further than Bethlehem Steel to discover an interested party. Bethlehem has no facilities in the Detroit area although it can water ship from Lackawanna and meet competition to a degree. However, the advantages of owning a modern property such as the Ford mill would be tremendous in the years ahead. Industry observers around Detroit feel the negotiation of such a sale is a good bet.

Ford probably would not dispose of blast furnaces because of the requirements for foundry iron and because of the physical location of the furnaces with respect to the rest of the Ford plant. It would not be too difficult to effect a separation of open hearths and steel rolling mills from the balance of the Rouge so they could be operated independently.

While the Ford-Bethlehem tieup is a natural expectation, it was not the motivating force behind Ford's decision to establish major manufacturing facilities at Buffalo. The excellent rail and water shipping facilities there make its selection ideal both for intake of raw material and shipment of stampings to eastern assembly points. Beyond that, the new facilities will expand overall pressed steel capacity and die shop facilities, permitting improved quality and production control.

Spurs Equipment Sales—Release of equipment for the Ford plant will give an important boost to sales of presses, welders, conveyors, mechanical handling and die shop equipment which have been none too active in recent months. The plant is the largest one of its type to be built since the last of the Fisher Body stamping units at Hamilton, O. It will be of one-story design, covering about 1 million sq ft.

New Car Delivered Prices at Detroit Compared

INTERESTING comparison of current new car "advertised delivered prices" has been compiled by the editors of *Automotive News*, Detroit, through whose courtesy it is reproduced. Prices are those quoted at factory cities on four-door sedans and include dealer handling and preparation charges and federal taxes. They do not include state taxes, transportation charges or any optional equipment. Rated from the lowest to the highest, the tariffs are:

Chevrolet Special	$1,460	Buick Super	2,157
Ford Six	1,472	DeSoto Custom	2,194
Chevrolet Deluxe	1,539	Kaiser Deluxe	2,195
Ford V-8	1,546	Nash Ambassador Super	2,195
Ford Custom Six	1,559	Hudson Super Six	2,207
Plymouth Deluxe	1,566	DeSoto Carry-All	2,211
Ford Custom V-8	1,638	Oldsmobile 88 Town Standard	2,233
Plymouth Special Deluxe	1,644	Nash Ambassador Super Special	2,243
Studebaker Champion Deluxe	1,689	Oldsmobile 88 Standard	2,244
Pontiac Streaml. 6 Standard	1,740	Packard Eight	2,249
Pontiac Chieftain 6 Standard	1,761	Kaiser Vagabond	2,288
Studebaker Champion Regal Del.	1,762	Hudson Super Eight	2,296
Pontiac Streaml. 8 Standard	1,808	Studebaker Land Cruiser	2,328
Nash 600 Super	1,811	Chrysler Windsor	2,349
Oldsmobile 76 Town Standard	1,821	Nash Ambassador Custom	2,363
Pontiac Chieftain 8 Standard	1,829	Oldsmobile 88 Town Deluxe	2,364
Oldsmobile 76 Standard	1,832	Oldsmobile 88 Deluxe	2,375
Pontiac Streaml. 6 Deluxe	1,835	Hudson Commodore Six	2,383
Nash 600 Super Special	1,849	Packard Deluxe Eight	2,383
Pontiac Chieftain 6 Deluxe	1,856	Frazer	2,395
Dodge Meadowbrook	1,866	Hudson Commodore Eight	2,472
Pontiac Streaml. 8 Deluxe	1,903	Oldsmobile 98 Standard	2,500
Pontiac Chieftain 8 Deluxe	1,924	Lincoln	2,575
Buick Special	1,925	Oldsmobile 98 Deluxe	2,594
Dodge Coronet	1,945	Frazer Manhattan	2,595
Oldsmobile 76 Town Deluxe	1,963	Packard Super Eight	2,633
Oldsmobile 76 Deluxe	1,974	Chrysler Saratoga	2,635
Kaiser Special	1,995	Buick Roadmaster	2,735
Nash 600 Custom	2,000	Chrysler New Yorker	2,751
DeSoto Deluxe	2,006	Cadillac Series 61	2,893
Studebaker Commander Deluxe	2,019	Packard Super Deluxe Eight	2,919
Dodge Coronet Town	2,029	Kaiser Virginian	2,995
Mercury	2,031	Cadillac Series 62	3,050
Kaiser Traveler	2,088	Lincoln Cosmopolitan	3,238
Studebaker Commander Regal D	2,141	Cadillac Series 60 Special	3,828
Chrysler Royal	2,154	Packard Custom Eight	3,975

Nash Changing Models

NASH suspended operations at its Wisconsin plants on Aug. 16 for a scheduled two-week model change and inventory period. A number of revisions in body styling are contemplated for both the 600 and Ambassador models, including more glass area, particularly in the rear. A shorter-wheelbase, narrower-tread model, to be powered by the 600 engine, is not yet ready for the as-

sembly line and apparently will not make its appearance before year-end. Comment in the trade runs to the effect the new job may be trimmed to around 100-inch wheelbase and 50-inch tread, doubtless with the idea of giving Nash a model in the lowest-priced field.

Production through August should come close to 100,000. Meanwhile, record-breaking retail sales continued through the first ten-day period of the month, being 52 per cent ahead of the same interval a year ago and the highest of any similar period in nearly 50 years of passenger car manufacture. Production schedules for early fall and winter have been shoved up another notch.

Hudson at 20-Year Peak

HUDSON retail deliveries cleared the 100,000-mark in the second week of August to set the greatest sales pace since 1929. This figure was not reached last year until the fourth week in November. Plans are nearing completion for the start of a new small model at Hudson plants, with one assembly line being cleared for it. Shorter wheelbase, narrower tread and an "economy" engine are expected features, along with reduced price.

New Disk Brake Introduced

A NEW type of disk brake being introduced on Chrysler Crown Imperial represents the first important step forward in automotive brake design since the advent of the hydraulic brake. Essentially, the brake utilizes two flat cast aluminum pressure plates inside a flat cast iron housing, instead of the conventional shoe and drum. The design permits an increase in brake lining area of about 30 per cent, improved cooling and less possible deflection of the brake housing under extreme braking conditions.

To obtain braking, the plates are moved apart by the action of hydraulic wheel cylinders until they come into contact with the flat surfaces of the rotating housings, the latter being bolted to the car wheels. The plates have segments of brake lining bonded to their outside surfaces. Between the plates are six round steel balls, each positioned in small pockets machined into the inside surfaces of the plates. When the plates rotate in counter directions their movement tends to push the balls out of the sockets and up onto small ramps in the plates, this in turn forcing the plates apart and constituting a self-energizing feature. Further technical details and illustrations will be presented in an early issue of STEEL.

New Engines Developed

DEVELOPMENT and testing of new types of automobile engines is proceeding at an accelerated pace, the direction naturally being toward higher compression and economy. Ford has a dozen or more different types of fours, sixes and eights on test blocks, while recently Chrysler sent through specifications for a lot of blocks for a new high-compression valve-in-head unit which presumably will be installed in test cars for road work. Modifications will be made in the Chevrolet engine to accommodate the torque converter transmission to be optional on 1950 models built by this division. Somewhat higher horsepower is required for optimum operation of the transmission and the revised engine will provide this. Several thousand of the transmissions already have been completed by a Chevrolet plant in Cleveland and there are indications the equipment may carry a price as low as $100.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1949	1948
January	445,092	422,236
February	443,734	399,471
March	543,711	519,154
April	569,728	462,323
May	508,101	359,996
June	623,689	454,401
Six mos.	3,134,055	2,617,581
July	605,000*	489,736
August		478,186
September		437,181
October		516,814
November		495,488
December		514,337
12 mos.		5,549,323

*Preliminary.

Estimate for week ended:

	1949	(Same week) 1948
Aug. 6	142,718	108,864
Aug. 13	144,317	112,342
Aug. 20	146,545	113,324
Aug. 27	150,000	100,699

Estimates by Ward's Automotive Reports

Chrysler Loses 4 Days

A MINOR altercation in the soldering department at a Chrysler plant, involving the dismissal of one workman for failure to do his work properly and the subsequent firing of a union steward for ordering the department to quit work, ran the usual course recently and forced practically complete suspension of Chrysler and DeSoto operations with the loss of nearly four days assemblies. The stoppage was growing progressively worse and it appeared that it might be necessary to instruct suppliers to stop shipments, when an agreement was reached and work resumed early last week.

The Chrysler-UAW negotiations are dragging along, waiting for the "pattern" and the latest move has been the request by the union for the state mediation board to conduct a strike vote such as was held recently among Ford workers. Little will be accomplished beyond expenditure of more of the taxpayers' money, but this appears to be the union technique to cast adverse reflections on the Michigan Bonine-Tripp Act, which calls for strike votes before they may be authorized.

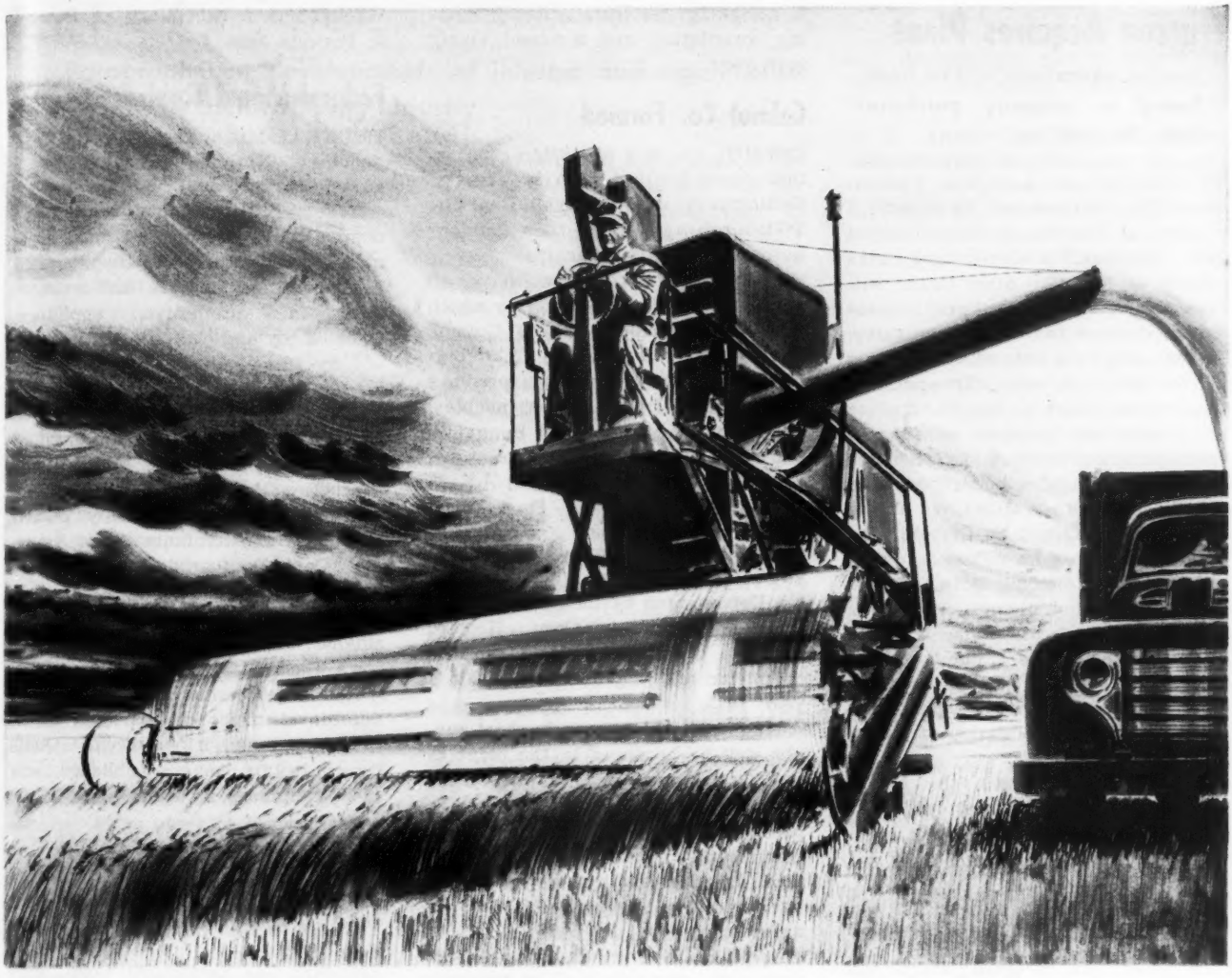
Inventories Low

PONTIAC'S 4000 dealers, 15 per cent of whom are newcomers since the end of the war, have about a ten-day supply of new cars in hand and in transit, comparing with a normal 30-day stock. Their used cars number around 22,000 or the equivalent of a 14-day inventory. Sixty per cent of current new-car sales involve tradeins, against 80-90 per cent prewar, and about 70 per cent of all new-car buyers are trading-in postwar models. Sales are roughly 65 per cent in the "notched-back" design, increasing from 50 per cent last winter, the balance being the streamliner design. New car sales are particularly strong in rural areas where there are generally extended waiting lists. The division hopes to build 350,000 cars this year, against 248,000 last year, and through Aug. 15 had completed well over 205,000. Introduction of 1950 models is not expected before January and modifications will not be important since a major body change was made this year.

Single Jeep Digging Trench

A SINGLE Willys-Overland Jeep is being used to dig 20 miles of trenches at the Cleveland Municipal airport.

Airport's Jeep "mole" is equipped with a "Jeep-a-Trench" ditcher operated from the Jeep's power take-off. It is capable of digging up to 300 feet of trench per hour. Trenches at the airport are being excavated to a depth of 3 feet on the field's perimeter and along runways for the installation of boundary and landing lights.



When These 6,377 Fasteners Pay Off!

Dark sky . . . wind . . . devastating rain mean there's no time to lose. So you give 'er everything she's got and pray you'll get in most of the crop before it's too late. That's when the holding power of the 6,377 fasteners in this combine really pay off.

1867 bolts . . . 415 cap, set and tapping screws . . . 1840 rivets . . . 2255 nuts form the steel network that locks the framing members of this combine together.

Because these fasteners are called upon to hold their own on a rugged day-in and day-out schedule, top quality is essential. That's why Russell, Burdsall and Ward with 104 years' experience still carries on intensive research and development work to improve fastener holding power further.

It is unsound economy to use inferior fasteners, since the price of fasteners is such a small part of the total product cost. It isn't the initial price but the cost of *using* fasteners that counts.

To attain *True Fastener Economy*, you can save assembly time, reduce plant inspection, and get the maximum holding power per dollar of fastener cost with a dependable quality fastener. *True Fastener Economy* contributes to the kind of production savings that put more and more combines on U. S. wheatfields every year. It is this type of contribution to major American industries that explains why—for over 104 years—RB&W has been *making strong the things that make America strong.*

RUSSELL, BURDSALL & WARD • BOLT AND NUT COMPANY

RB&W

Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Cal. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Oakland, Portland, Seattle. Distributors from coast to coast.

6,377 Fasteners are used in 1 American Combine

104 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

Truscon Acquires Plant

Canton operations will be transferred to property purchased from Diebold Inc.

TO EXPAND its activities, Truscon Steel Co., Youngstown, is acquiring a plant at Canton, O., from Diebold Inc. Truscon, a fabricating subsidiary of Republic Steel Corp., will transfer Canton operations of its screen division to the new property. It has outgrown present facilities.

The property which Truscon has acquired is known as the No. 2 plant of Diebold and consists of a main manufacturing building, two smaller storage buildings, a boilerhouse and a cafeteria. Other structures at the site will be retained by Diebold. The acquisition provides Truscon with 120,397 sq ft of floor area, 104,870 of it in the main building.

Diebold, which will concentrate its operations at its No. 1 plant in Canton, said the property transfer is the final step in its cost-reducing, efficiency-raising consolidation of manufacturing activities.

Diebold is to vacate the No. 2 plant not later than next Jan. 16.

New Metal Engineering Firm

ESTABLISHMENT of Ted Kuck Co. Inc., Sheboygan, Wis., gives that city a new metal engineering and contracting business. It will specialize in designing and installation of heating, ventilating and air-conditioning systems.

Colmol Co. Formed

COLMOL Co. is a new Ohio corporation owned jointly by Jeffrey Mfg. Co., Columbus, O., and Sunnyhill Coal Co., Pittsburgh, to develop the "Colmol," automatic mining machine.

Company is an outgrowth of an agreement made last spring by which Sunnyhill, developer of the Colmol, joined Jeffrey to use the Columbus' firm's facilities to improve, produce, market and service the new machine. C. H. Snyder, president of Sunnyhill, will head the new corporation.

Magnesium Plant for Detroit

NEW PLANT for production of sheet and plate magnesium will be built in the Detroit area by the newly formed Wrought Magnesium Corp. Howard Perkins, president, says it will be completed and in production within a year.

Magnesium plate, now in short supply, will be produced in the plant at a 500,000-pound-per-month rate. Much of the mill's capacity will be used in production of military and commercial aircraft, it is anticipated. Plans for acquisition of a 10-acre site and a building of 40,000 sq ft are underway.

Incorporated in Delaware with an authorized capital of $900,000, Wrought is a subsidiary of Brooks & Perkins Inc., Detroit.

Federal-Mogul Acquires Formetal

FEDERAL-Mogul Corp., Detroit, has acquired National Formetal Co., Cleveland.

Federal-Mogul makes automotive engine bearings, and National Formetal manufactures rolled split bushings, bearings, spacers and washers used in automotive, appliance, wheeled toy and other industries.

Alcoa Plant Readies for Output

ULTRAMODERN plant for producing fluoride chemicals, widely used synthetics, has been completed by Aluminum Ore Co., wholly owned subsidiary of Aluminum Co. of America. Capable of producing 10 million pounds of fluorides per year on one-shift operation, the plant replaces smaller, less efficient facilities at Alcoa's East St. Louis works.

Full-scale commercial production of fluoride chemicals is expected to be underway within a few weeks. Quality control is being established, and new equipment is being tested.

Hart Acquires Range Rights

HART Mfg. Co., Louisville, has acquired the property and rights to manufacture commercial ranges of Standard Gas Equipment Corp., Baltimore. Plant will be known as Vulcan Division of Hart Mfg. Co.

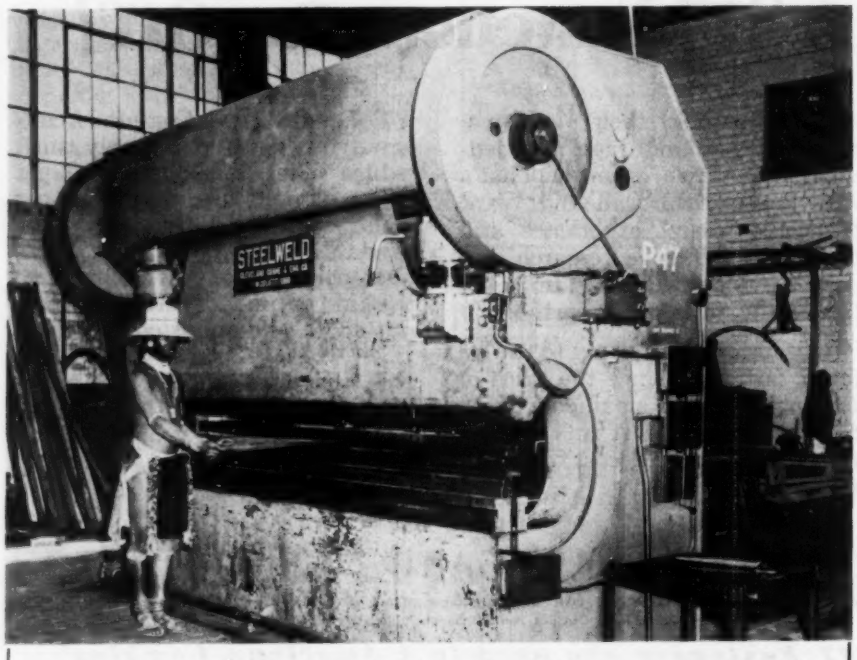
Bechtel To Build Cracking Plant

BECHTEL Corp., San Franciso, will design and build the catalytic cracking plant for Salt Lake Refining Co., at Salt Lake City, Utah. Salt Lake is a subsidiary of Standard Oil Co. of California, and the project is a part of the $10 million expansion program being undertaken by Standard at the Salt Lake plant. Completion is expected by end of 1950.

Temco Awarded Contracts

TEXAS Engineering & Mfg. Co., Dallas, has been awarded a contract to swage 243 engine mount tubes, one of the most intricate yet undertaken in the Southwest, by Chance Vought Aircraft Division, Dallas. Tubes are of chrome-moly steel 3 inches in diameter with 1.20 wall thickness and are swaged to a 2-inch diameter. Contract also calls for magnafluxing all pieces.

Temco also got an initial contract for fabrication of 22 structural brackets for Chase Avitruks by Chase Aircraft Corp., Trenton, N. J.



RIGHT IDEA: Clothing worn by the native Zulu press operator might prove to be the right idea for improving employee morale and plant efficiency when days are hot. The Steelweld bending press, built by Cleveland Crane & Engineering Co., Wickliffe, O., is in the plant of Steel & Power Products Ltd., Johannesburg, South Africa

Briefs . . . .

Paragraphs on developments of interest and significance within the metalworking industry

Hamilton Mfg. Co., Two Rivers, Wis., welcomed more than 100 dealer salesmen from all over the U.S. and Canada at its second three-day school for personnel handling the firm's drafting equipment line.

—o—

Federal Steel Warehouse Corp. is a new company formed at Dayton, O., to deliver steel. It is headed by Harold R. Rubin, former Detroit industrialist.

—o—

Racine Tool & Machine Co., Racine, Wis., played host to 40 special sales representatives of the company at the company's national sales conference this month. Racine's greatest expansion since the war has been in the production of hydraulic equipment.

—o—

James S. Corbin, formerly sales manager of Eastern Division of James Flett Organization Inc., has formed a company for scrap marketing service. Firm name is James Corbin & Associates; offices are at 2854 Hudson Blvd., Jersey City, N. J.

—o—

Joseph B. Kushner, metal finishing engineer of Stroudsburg, Pa., has introduced a correspondence course in electroplating and metal finishing: "Electroplating Know How."

—o—

Lindsay Corp., Chicago and Melrose Park, Ill., has been reorganized. Now Lindsay Structure Inc., it has acquired all patents, trademarks and special equipment of Lindsay Corp. It will continue to market Lindsay products but will contract for their manufacture with Maysteel Products Inc., Mayville, Wis. Lindsay Structure will maintain its offices at 1740 N. 25th Ave., Melrose Park.

—o—

Cory Corp. and Fresh'nd Aire Co., Chicago, appointed Dance-Fitzgerald-Sample Inc., Chicago, to handle trade and consumer advertising on Cory coffee brewers, electric knife sharpeners, Fresh'nd Aire fans, air circulators, humidifiers and heater fans.

—o—

Stanley Works Steel Division, New Britain, Conn., appointed Walter H. Rothschild, New York, as export representative.

—o—

Vacuum Cleaner Manufacturers' Association says factory shipments of standard size household vacuum cleaners in July were 161,920 units, compared with 207,354 in June, a decrease of 21.4 per cent and 27.2 per cent less than the 222,478 units in July, 1948, alltime high year. July decrease was attributed to lowered factory production because of vacations and to reappearance of the usual seasonal downturn.

—o—

United Engineering & Foundry Co.'s New Castle, Pa., plant was selected by Labor Department's Bureau of Apprenticeship as the location for on-the-job training of a Brazilian industrial trainee. Aleksey Bautzer of Rio de Janeiro is the first Brazilian to come to the United States under the industrial training program for foreign nationals. He is studying the construction and mounting of heavy machinery.

—o—

Phillips Bros. Screw Products Co., manufacturer of automatic screw and allied machine products and Phillips Universal Indicator holders, has moved to 2909 S. Logan St., Lansing, Mich.

—o—

Detroit Broach Co. appointed Miller-Barber Associates, New Rochelle, N. Y., as representatives in lower New York, northern New Jersey and Connecticut except Hartford county.

—o—

Ramtite Co., Cleveland, boiler setting contractor, has established a direct branch office with complete warehouse stocks of refractory materials. Address is 1530 River Bed Ave., Cleveland.

—o—

Ziegler Steel Service Co. opened an office and warehouse in Oakland, Calif. Philip S. Champion, formerly with Taylor & Spotswood Co. and Kaiser Shipyards, is manager of the Oakland Division.

—o—

Phoenix Oil Co., Cleveland, appointed Lubricants Inc., Detroit, sales and service agent for its complete line of metal drawing compounds and special lubricants in Michigan.

—o—

Globe Steel Tubes Co., Milwaukee, appointed John A. Rhodes Co. Inc., Springfield, Mo., distributor of Globe seamless welding fittings and flanges.

—o—

Chain Belt Co. of Milwaukee appointed Buford Brothers Inc., Nashville, Tenn., and Bearing & Transmission Co., Findlay, O., as distributors of products made by the Chain & Transmission and Baldwin-Duckworth divisions of the company. Chain Belt manufactures Tex Temperin sprockets, Baldwin-Rex flexible couplings, Rex food processing equipment, etc.

—o—

B. C. Ames Co., Waltham, Mass., manufacturer of micrometer dial indicators and gages, has appointed E. L. Sandberg Co. of Minneapolis exclusive sales representatives in Minnesota and western Wisconsin.

—o—

Metal Hydrides Inc., Beverly, Mass., which completed additional facilities for the manufacture of lithium aluminum hydride, now makes the material available commercially. Company's new technical bulletins point out fields in which this compound has uses.

—o—

Consolidated Western Steel Corp., subsidiary of U. S. Steel on the Pacific Coast, is applying for a certificate to do business in Pennsylvania. Company will engage in general contracting and construction. U.S. Steel officials say the company will assist in an engineering capacity in construction of the new electric welded steel pipe mill at McKeesport, Pa.

—o—

Payne Furnace Division of Affiliated Gas Equipment Inc. is moving its manufacturing facilities from Beverly Hills to Monrovia, Calif. There, plants of Day & Night Division, manufacturer of water heaters and Panelray space heaters, are being expanded to accommodate the Payne line.

—o—

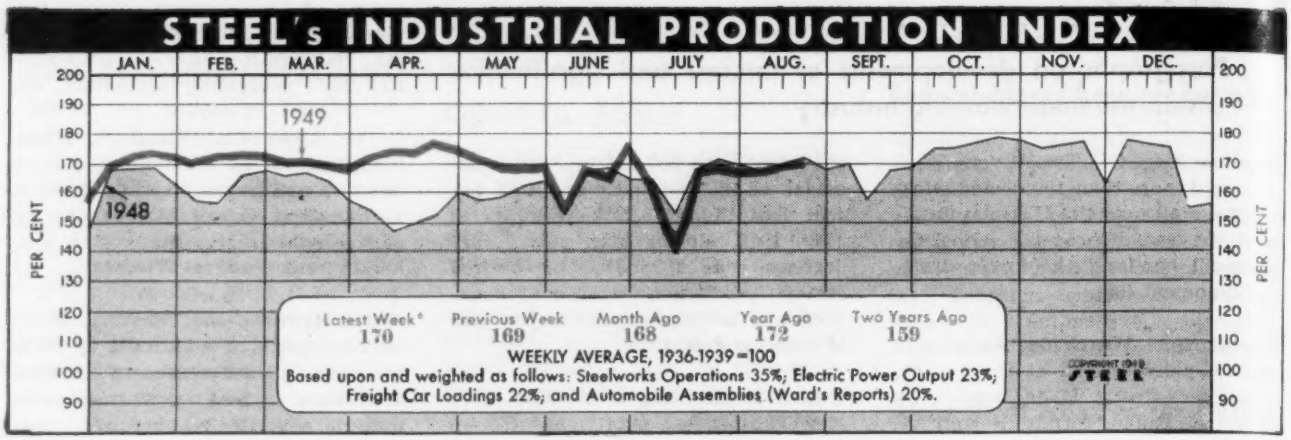
Defiance Machine Works, Defiance, O., has sold its machinery and equipment through Al E. Reuben Co. to an undisclosed purchaser. The buyer has made arrangements with Industrial Plants Corp., Chicago, to dispose of the equipment at a public auction Sept. 20 and 21. Defiance also will sell or lease its land and buildings, comprising 175,000 sq ft.

—o—

Ampco Metal Inc., Milwaukee, appointed W. P. & R. S. Mars Co., Duluth, as a distributor of the complete line of Ampco welding electrodes, Ampco-Trode, Phos-Trode, Sil-Trode and Beryl-Trode. Mars will cover northern Minnesota, the upper peninsula of Michigan and the northern counties of Wisconsin.

—o—

Resistance Welding Institute headquarters have been moved to the Hartman Building, Warren Rd. at Detroit Ave., Cleveland. Institute is an educational organization established earlier this year by Resistance Welder Manufacturers Association to serve as an information clearing house.


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1949
1948
PER CENT
Latest Week* 170
Previous Week 169
Month Ago 168
Year Ago 172
Two Years Ago 159
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
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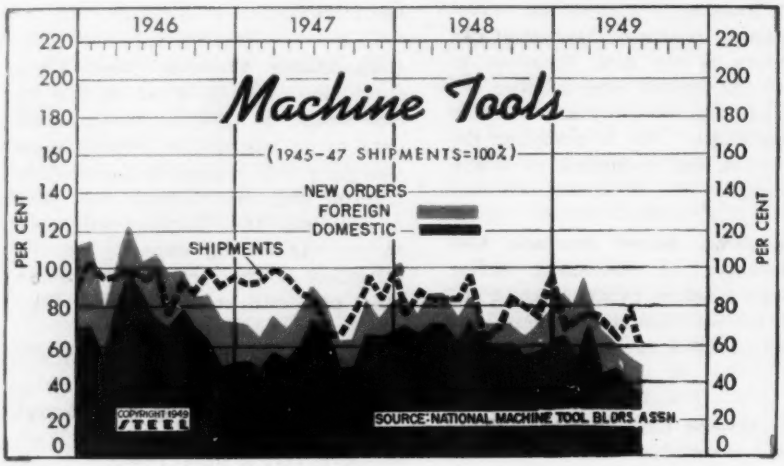
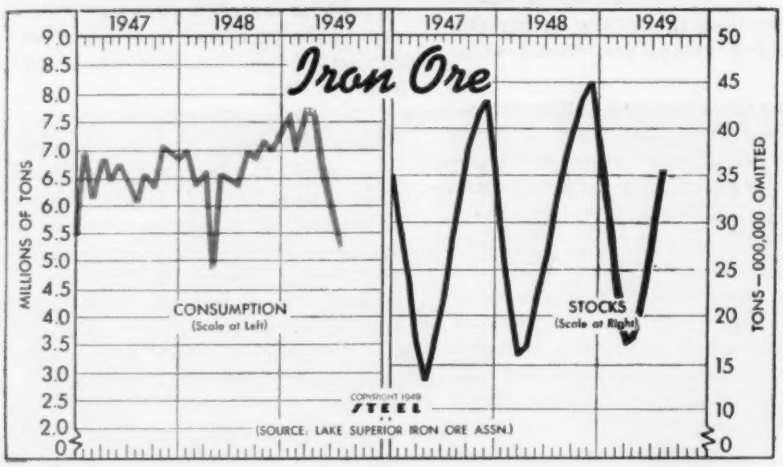
*Week ended Aug. 20 (preliminary).



Machine Tools

(1945-1947 Shipments = 100)

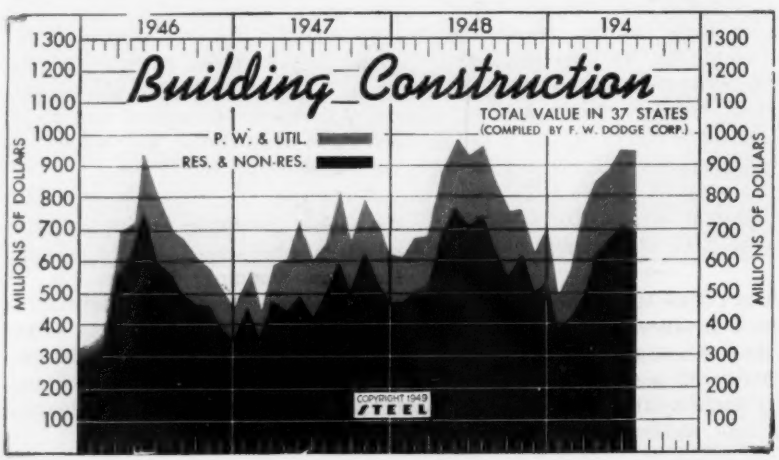
	Orders				Shipments	
	Total		Domestic			
	1949	1948	1949	1948	1949	1948
Jan.	87.0	83.1	65.1	69.1	68.8	75.3
Feb.	80.9	77.3	54.4	64.6	70.3	87.1
Mar.	93.5	86.3	71.2	70.2	75.8	83.6
Apr.	70.1	86.3	47.0	72.2	74.7	82.0
May	63.7	73.5	47.9	62.1	72.8	82.6
June	53.6	83.4	38.0	71.5	79.0	94.4
July	48.0	74.0	33.8	61.1	60.8	62.4
Aug.	...	73.7	...	60.9	...	69.8
Sept.	...	73.1	...	61.5	...	84.7
Oct.	...	67.4	...	53.4	...	80.4
Nov.	...	72.2	...	54.1	...	76.2
Dec.	...	76.7	...	60.5	...	96.9



Iron Ore

(Lake Superior Iron Ore Assn.)
Gross tons—000 omitted

	Consumption		Stocks at Lake Erie Docks and Furnaces	
	1949	1948	1949	1948
Jan.	7,590	7,057	31,904	29,081
Feb.	6,992	6,440	24,981	22,628
Mar.	7,735	6,634	17,308	16,022
Apr.	7,322	4,976	17,803	17,125
May	7,277	6,656	21,508	22,058
June	6,249	6,577	27,696	26,965
July	5,258	6,479	35,064	32,611
Aug.	....	7,036	.....	37,081
Sept.	....	6,965	.....	40,923
Oct.	....	7,273	.....	43,883
Nov.	....	7,058	.....	45,160
Dec.	....	7,351	.....	39,460
Total	....	80,504		



Construction Valuation in 37 States

(Unit—$1,000,000)

	Total	Public Works, Utilities		Residential and Non-residential	
	1949	1949	1948	1949	1948
Jan.	483.0	102.0	136.6	381.0	478.6
Feb.	568.5	153.5	177.3	415.0	504.6
Mar.	747.6	168.4	164.3	579.2	525.5
Apr.	842.6	222.4	184.7	620.2	689.2
May	880.3	213.5	205.0	666.9	765.8
June	945.7	239.0	215.7	706.7	719.5
July	943.6	252.7	217.9	690.9	744.8
Aug.	....	....	207.8	....	646.3
Sept.	....	....	202.7	....	559.5
Oct.	....	....	165.5	....	613.1
Nov.	....	....	106.9	....	504.3
Dec.	....	....	170.9	....	523.1
Total	....	....	2,155.3	....	7,274.4

UNIVERSITY OF MICHIGAN LIBRARIES

The Business Trend

TEMPO of activity in the metalworking industry continued its slow rise in the week ended Aug. 20 as STEEL's industrial production index reached 170 per cent (preliminary) of the 1936—1939 average, up 1 point from the preceding week. In the corresponding week of 1948 the index was 2 points higher.

STEEL—The ingot rate also continued its steady advance in the week ended Aug. 20 to 83.5 per cent of capacity, giving material assistance to the climb of the industrial production index. This was the fourth consecutive increase in the steelmaking rate since the decline was checked in mid-July. Operations are still well below the same week in 1948 but another increase in the ingot rate is in prospect for the current week. The immediate future for the industry is beclouded by the possibility of a strike which at the moment is a bigger problem than lessened demand for steel.

AUTOMOBILES—Passenger car and truck assemblies rose to 146,545 units in the week ended Aug. 20, a gain of more than 2000 over the revised total of 144,317 for the preceding week. The industry's sights are still set on an alltime monthly record for the industry. U. S. plants are expected to produce 643,092 vehicles during the month, compared with 621,910 in April, 1929. The U. S. passenger car mark of 537,564 set in that 1929 month is expected to fall to the projected August total of 543,000. Return of torrid weather or another outbreak of labor trouble could keep outturn in U. S. plants from the anticipated monthly records. The industry expects to maintain output at high levels for the rest of 1949 as sales continue to keep pace with production.

RAILROADS—Class 1 railroads put 1157 new locomotives in service in the first seven months of 1949, largest number in any corresponding period since 1923. The Association of American Railroads total shows 1112 diesel and 45 steam locomotives installed. On order Aug. 1 were 980 diesel, 25 steam and 4 electric locomotives. Class 1 railroads also installed 60,486 freight cars in the first seven months of 1949 for the best total for the period since 1929. Freight cars on order Aug. 1 were down to 36,564. On Aug. 1 a year ago all railroads and private carlines had 125,290 new freight cars on order.

CONSTRUCTION—Civil engineering construction volume was down to $137.2 million in the week ended Aug. 18, following two consecutive weeks in which records for the year were set. Although the latest week's contracts were 47 per cent below the preceding week, they were 17 per cent above the corresponding week last year.

COAL—Bituminous coal production was about 8 million tons in the week ended Aug. 13, compared with 12,561,000 in the same week in 1948. With coal mining operations continuing on a three-day week, the gap between the totals mined in corresponding periods of 1949 and 1948 grows steadily wider. Totals are 297.3 million tons and 359.6 million tons in 1949 and 1948, respectively.

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	83.5	82.5	77.0	95.0
	Electric Power Distributed (million kilowatt hours)	5,579	5,530	5,461	5,391
	Bituminous Coal Production (daily av.—1000 tons)	1,333	1,258	1,100	2,094
	Petroleum Production (daily av.—1000 bbl)	4,723	4,723	4,684	5,521
	Construction Volume (ENR—Unit $1,000,000)	$137.2	$257.3	$158.8	$117.1
	Automobile and Truck Output (Ward's—number units)	146,545	144,317	160,173	113,324
	*Dates on request. †1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons.				
TRADE	Freight Carloadings (unit—1000 cars)	720†	728	719	901
	Business Failures (Dun & Bradstreet, number)	193	176	182	94
	Money in Circulation (in millions of dollars)‡	$27,383	$27,409	$27,366	$27,979
	Department Store Sales (changes from like wk. a yr. ago)‡	−16%	−12%	−10%	+14%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$12,644	$11,381	$13,187	$13,855
	Federal Gross Debt (billions)	$254.9	$254.5	$252.9	$253.4
	Bond Volume, NYSE (millions)	$16.1	$15.7	$22.9	$12.1
	Stocks Sales, NYSE (thousands of shares)	5,020	5,876	5,286	3,076
	Loans and Investments (billions)†	$64.2	$63.8	$62.9	$63.0
	United States Gov't. Obligations Held (millions)†	$36,144	$35,773	$35,254	$34,660
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Composite Finished Steel Price Average	$91.55	$91.55	$91.82	$93.55
	STEEL's Nonferrous Metal Composite‡	180.1	180.0	175.9	220.6
	All Commodities†	151.9	152.7	154.3	169.9
	Metals and Metal Products†	167.9	167.9	167.8	170.0
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100.				

Men of Industry

ELDEN T. DAVIS

Elden T. Davis has been appointed comptroller and assistant secretary of Cleveland Chain & Mfg. Co., Cleveland, and its associated concerns. He has been a member of the company's financial division for 23 years. In addition to his post with Cleveland Chain, Mr. Davis will hold similar positions with Bridgeport Chain & Mfg. Co., Bridgeport, Conn.; Woodhouse Chain Co., Trenton, N. J.; Seattle Chain & Mfg. Co., Seattle; and Round California Chain Co., Los Angeles and San Francisco.

—o—

Frank J. Aschenbrenner and **Earl C. Clark** have been appointed assistant directors of research and engineering, Air Reduction Sales Co., New York. The technical relations department has been transferred from research and engineering to the secretary's department, with **John J. Crowe,** assistant vice president and manager of the technical relations department, reporting to **J. D. Gunther,** secretary. Mr. Aschenbrenner will be in charge of the company's Murray Hill, N. J., laboratory, and Mr. Clark has been placed in charge of the development and engineering groups. **Dr. L. I. Gilbertson** has been appointed administrative manager in charge of business management, and **L. M. von Wanckel** as executive accountant. **Fredrick C. Saacke** has been appointed safety engineer of the organization, and in addition, will assist Mr. Crowe in technical relations.

—o—

John S. Conant has been elected president of Technical Managers Inc., New York. He formerly was general purchasing agent and later director of procurement for Willys-Overland Motors Inc., Toledo, O., and from 1940 to 1943 was associated with American Steel & Wire Co., Cleveland.

—o—

George C. McCormick has been appointed sales manager, Industrial Heating Equipment Co., Detroit. He was associated for 14 years with General Alloys Co., Boston, and held the position of vice president in charge of engineering. He later was president of Sterling Alloys Co. and manager of the Heat Treating Division, Loftus Engineering Corp. **Clifton E. Wenger** has been appointed to the position of controlled atmosphere engineer for Industrial Heating Equipment Co., to take charge of the development and engineering in gas atmosphere furnaces. He formerly was in the metallurgical departments of Buick Motor Division and Detroit Transmission Division of General Motors, and more recently was service manager at Dow Furnace Co.

—o—

S. L. Manning has been appointed by Reynolds Metals Co., Louisville, as assistant product manager for its Wire, Rod, Bar, Structurals and Cable Division. He joined the company in 1940, and during World War II was production manager of wire, rod, bar and fabrication in its merchant mill in Louisville. He also handled mill scheduling and the packing and shipping departments. He later was appointed sales manager of the Cleveland division sales office.

—o—

Ray T. Melville has been named Buffalo district sales manager for Hanna Furnace Corp., and **Carl A. Harmon** has been appointed sales manager of pig iron specialties for all districts, with headquarters in Buffalo. Mr. Melville has been a sales representative for Hanna in Buffalo, and Mr. Harmon has been chief metallurgist. The district sales manager post has been open since **William Kerber** was transferred from Buffalo to Detroit as a vice president.

—o—

A. C. Runnette has been named manager of sand and permanent-mold casting product sales for Aluminum Co. of America, Pittsburgh. A member of the company's sales organization since 1927, Mr. Runnette was manager of its jobbing product sales division from 1943 until the present time. He succeeds

SAMUEL SPILKA

Wiser Brown, who is vice president and general manager of the company's subsidiary, American Magnesium Corp., and who will devote his full time to this subsidiary's activities in magnesium products.

—o—

Samuel Spilka has been appointed secretary-treasurer of TelAutograph Corp., New York. He previously served as assistant treasurer of the company, which he joined in 1946.

—o—

Charles M. Kearns Jr. has been appointed engineering manager of Hamilton Standard Propeller Division, United Aircraft Corp., East Hartford, Conn., filling the post left vacant when **Erle Martin** became general manager in 1946. In directing activities of the engineering organization, Mr. Kearns will be assisted by **Carl F. Baker,** chief engineer. Mr. Baker will continue to direct administration of the division's expanding engineering department and all engineering activity concerning propellers and other products released for production.

—o—

E. T. Warren has been appointed vice president of Tata Inc., New York. He recently returned from India, where he was assistant general superintendent of Tata Iron & Steel Co. Ltd. in Jamshedpur. Prior to 1938 Mr. Warren was at the Homestead and Edgar Thompson plants of Carnegie-Illinois Steel Corp.

—o—

W. A. Brown Jr. has been appointed vice president and general manager of Liquid Carbonic Corp., Chicago. He formerly was vice president of the Compressed Gas Division in New York, and will now have headquar-

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A-2027

GEORGE PERRAULT JR.

ters in Chicago. **J. H. Pratt,** formerly executive vice president, has been appointed chairman of the finance committee of the board of directors. **R. C. Holbrook,** president and a director of Liquid Carbonic Canadian Corp., was elected a director of the Chicago corporation to succeed **C. G. Carter,** retired.

—o—

George Perrault Jr. has been appointed sales manager, Rolling Mill Division, E. W. Bliss Co., in Salem, O. Mr. Perrault was formerly sales and advertising manager of Salem Engineering Co.

—o—

Oscar S. Stark has been appointed general sales manager, Photoswitch Inc., Cambridge, Mass., with headquarters in the factory sales office, New York. He formerly was with Square D Co., with which he had been connected in various sales and management capacities since 1930.

—o—

Richard Harte has been elected a director of National Steel Corp., Pittsburgh. He is president of Ames Baldwin Wyoming Co., Parkersburg, W. Va.

—o—

Harvey G. Hensel, safety director of the western district of Youngstown Sheet & Tube Co., Youngstown, has been appointed a member of the general advisory council to the Indiana Division of Labor.

—o—

B. D. Bruce, associated with Chicago Vitreous Enamel Product Co., Cicero, Ill., has been transferred from the research division to the service staff.

—o—

Donald G. Clark has resigned from Gulf Oil Corp., Pittsburgh, due to ill health, but will continue to act in an advisory capacity. He has been director of purchases of Gulf companies since 1939, and that position is now being discontinued. **Lee C. Bock,** who has been general purchasing agent for the past three years, will be in charge of purchases for all Gulf companies. He has been with Gulf for 38 years.

—o—

Glen W. Victory, formerly in charge of purchasing at the Ottawa, O., plant, has been appointed manager of purchasing for the Television Picture Tube Division of Sylvania Electric Products Inc., Seneca Falls, N. Y.

—o—

Richard H. Marshall, formerly production metallurgist of Timken Roller Bearing Co., Canton, O., has joined the metallurgical staff of Climax Molybdenum Co., Chicago.

—o—

H. K. Arnold has been placed in charge of all automotive sales activities at the Hunting Park, Pa., plant of Budd Co., Philadelphia, and **T. J. Myer** has been given complete charge of all contacts with the Studebaker Corp.

—o—

K. D. Busbee has been appointed southwestern district representative of Oliver Iron & Steel Corp.'s pole line sales division, and will have headquarters in Dallas. Mr. Busbee will report to the corporation's southern sales headquarters at Birmingham.

—o—

John G. Kirkpatrick has been appointed to represent Kieley & Mueller Inc., North Bergen, N. J., in Pennsylvania, West Virginia and Ohio.

—o—

John M. Rogers, vice president and director of military sales for Douglas Aircraft Co. Inc., Santa Monica, Calif., has resigned his post after 18 years' service as an executive with the company. He will continue as a consultant on a part-time basis.

—o—

E. F. Houghton & Co., Philadelphia, announces changes in its eastern sales division, which has been divided into two sections: **Orum R. Kerst** will head the north section, including New England and New York state, and **J. R. Clendenning** will direct the south section, including Pennsylvania, New Jersey and Delaware. **A. C. Smith,** former assistant to the eastern sales manager, has been promoted to the newly created post of sales co-ordinator for the two eastern sections.

—o—

Black & Decker Mfg. Co., Towson, Md., announces appointment of **Earl Roberts** as a sales engineer with its Memphis, Tenn., branch. He previously was with the service department of that branch. **David Rolston** has joined the company, and will be home-utility sales representative in the Philadelphia territory.

—o—

D. E. Williard has been appointed manager of industrial cleaning equipment and chemical sales for the central region of the United States by Detrex Corp., Detroit.

—o—

O. G. Mandt has resigned as president of Jaeger Machine Co., Columbus, O., to be effective Sept. 17 following completion of 23 years' service with the company.

—o—

Lee R. Patterson has been made branch manager of the Columbia, S. C., plant of Southern States Iron Roofing Co. He was promoted from assistant manager of the Hattiesburg, Miss., plant.

—o—

George E. Gilliam has been appointed to manage pyrometer supplies sales nationally for Brown Instruments Division, Minneapolis-Honeywell Regulator Co., Minneapolis. He has been with the company for the last five years, most recently at its South Bend, Ind., branch office. Mr. Gilliam will make his headquarters in Philadelphia.

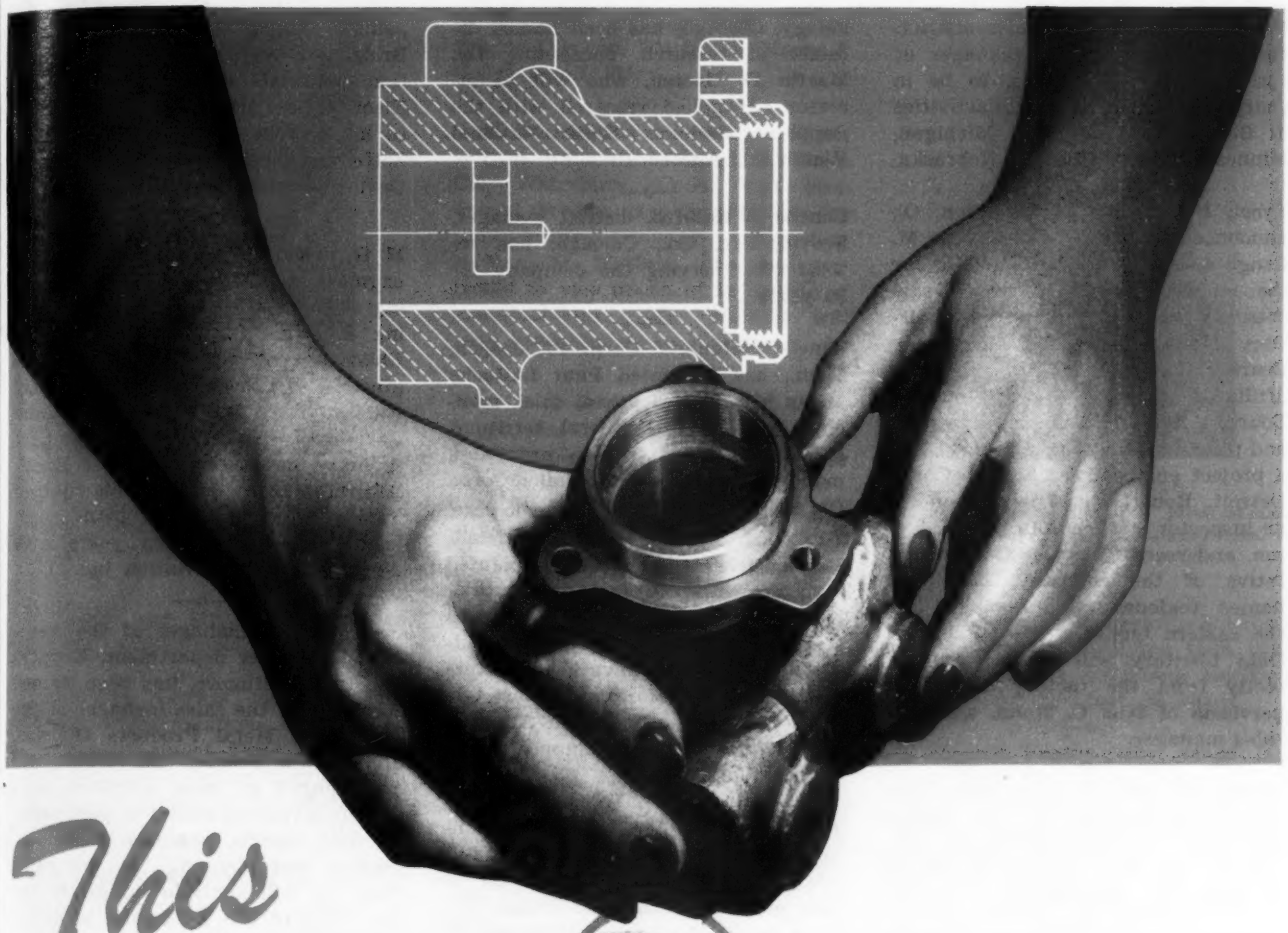
—o—

Peter Robertson has been appointed assistant vice president in charge of operations for the manufacturing divisions of Republic Steel Corp., Cleveland. He was appointed assistant to the manager of the company's Cleveland district a year ago, and was previously works manager of the Youngstown plant of Truscon Steel Co., a Republic subsidiary.

—o—

Diamond Alkali Co., Cleveland, announces the advancement of **Earl J. Mills,** manager of less-carload sales at its Chicago sales office, to man-

PETER ROBERTSON



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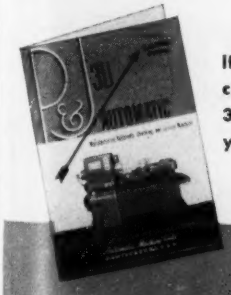

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PRODUCTION TOOLING HEADQUARTERS

ager of the Southwest sales district, and **Charles W. Klaus,** manager of carload sales at Chicago, to be in charge of Diamond sales activities in Illinois, Indiana, Iowa, Michigan, Minnesota, Wisconsin and Nebraska.

—o—

Tyson Bearing Corp., Massillon, O., announces appointment of **George M. Lange** as regional sales manager for the midwest area. He served successively as sales engineer and district manager for Timken Roller Bearing Co. from 1927 to 1944, was affiliated with the War Production Board, Aircraft Production Division, and prior to his new appointment was a project engineer for Excello Corp., Detroit. **Robert R. Flaisig,** formerly an inspector and metallurgist for Tyson, and recently a special representative of the company, has been named regional sales manager for the eastern territory. The Michigan-Ohio territory will be serviced directly from the factory under supervision of **Ivan C. Mann,** assistant sales manager.

—o—

Arthur E. May, vice president, Central States Engineering Inc., Appleton, Wis., has been appointed assistant to the chief engineer at Moore & White Co., Philadelphia.

—o—

Frederick Fahnoe, industrial chemist who has specialized in experimental plant design and acetylene chemical research, has joined the staff of the chemistry department of Kellex Corp. at the company's Jersey City, N. J., laboratory. Kellex Corp., engineering firm in the field of nuclear energy, is a subsidiary of M. W. Kellogg Co., New York.

—o—

W. E. Mahin, chairman of metals research at Armour Research Foundation of Illinois Institute of Technology, Chicago, has been named director of research, succeeding **Dr. Martin H. Heeren,** who will be director of applied research with the Sapphire Division, Elgin National Watch Co., Aurora, Ill.

—o—

Conrad J. Kalbfell, district manager, Scovill Mfg. Co., Chicago, has retired after serving the company for 30 years.

—o—

Nineteen Hundred Corp., St. Joseph, Mich., has appointed **Paul LaRoche** as its Whirlpool regional sales manager for the east-central territory. Mr. LaRoche was sales promotion manager in the East for Philco Corp., Philadelphia.

—o—

Ralph Doherty has been appointed division manager of areas comprising generally the West North Central states for Wilkening Mfg. Co., Philadelphia. He will have headquarters in Kansas City, Mo. For the last two years he has been manager, Automotive Division, Service Supply Corp., Philadelphia.

—o—

Eugene Mowlds Jr., contracting manager at Philadelphia for the last five years, has been named assistant to vice president, American Bridge Co., U. S. Steel subsidiary, Pittsburgh. He is succeeded at Philadelphia by **James C. Hamilton.** Mr. Mowlds has been associated with American Bridge since 1921 and served as contracting manager in Baltimore prior to his Philadelphia appointment. Mr. Hamilton has been employed by the firm since 1937, most recently as assistant contracting manager in Cleveland.

—o—

Eutectic Welding Alloys Corp., New York, has augmented its research staff with appointment of **Dr. Eugen Sovegjarto,** welding alloys research expert, formerly employed by metallurgical concerns in Germany.

—o—

E. R. Traxler has been named manager of the flat belting field engineering and development department, B. F. Goodrich Co., Akron. Mr. Traxler has been in production development for Goodrich since he joined the company in 1935.

—o—

Martin R. King has been appointed manager, apparatus department news bureau, General Electric Co., Schenectady, N. Y. Mr. King, who has been assistant manager of the apparatus news bureau since March, succeeds **C. P. Fischer Jr.,** named manager of a new promotional division.

—o—

Kenneth E. LaZette has been appointed supervisor of accounting, Bridgeport Works services, construction materials department, General Electric Co., Bridgeport, Conn. Prior to his present appointment Mr. LaZette was works accountant, Wiring Device Division, Lowell, Mass., works.

—o—

H. G. Erickson has been named chief engineer of the expanded engineering department at Texas Engineering & Mfg. Co., Dallas, and **L. A. Childs Jr.** will be assistant chief engineer. Mr. Erickson was formerly chief engineer for Luscombe Airplane Corp. and prior to that time was preliminary design engineer for Beech Aircraft Corp. Mr. Childs joined Temco as chief power plant engineer in 1946 after ten years with North American Aviation Inc.

—o—

S. H. Fedan, manager of the Aeromatic propeller department, Koppers Co. Inc., Baltimore, has been named assistant to the sales manager of the company's Metal Products Division. In his new position Mr. Fedan will be engaged in sales activities with all the division's products, particularly with market analysis, sales promotion and planning. At the same time he will continue to direct the activities of the Aeromatic propeller department.

—o—

Two supervisory positions in the accounting department of Carnegie-Illinois Steel Corp., U. S. Steel Corp. subsidiary, Pittsburgh, have been announced, advancing **Ralph C. Grimm** to the newly created position of assistant comptroller in charge of costs and statistics, and **Frederick A. Huhn** to the position of general works auditor in charge of plant accounting. Mr. Grimm has been employed by U. S. Steel and Carnegie-Illinois

WALTER H. WIEWEL
Appointed vice president-sales, Crucible Steel Co. of America. Noted in STEEL, Aug. 22 issue, p. 57

FRANK M. MASON JR.
Appointed director of engineering, Fairbanks, Morse & Co., Chicago. Noted in STEEL, Aug. 22 issue, p. 52

HOWARD H. WEBER

Appointed general sales manager, wire and cable department, United States Rubber Co., New York. Noted in STEEL, Aug. 22 issue, p. 52

since 1937 and Mr. Huhn has been with Carnegie-Illinois since 1935.

—o—

William H. Corwin has been appointed public relations director for Taylor Instrument Cos., Rochester, N. Y. He joined Taylor Instrument in 1942 as a member of the advertising department.

—o—

Ray H. Moore has joined the staff of Claude B. Schneible Co., Detroit, as a special consultant. Former connections include serving as consulting engineer for W. W. Sly Mfg. Co., American Wheelabrator Co., and manager of the consulting engineering division of National Engineering Co. He also was employed by the Whiting Corp. as manager of its Equipment Division.

—o—

Robert S. Ogg has been appointed educational director of the Diesel Engine Manufacturers Association. He succeeds **Ervin L. Dahlund,** who resigned from this position in June to become chief engineer, Diesel Engine Division, Fairbanks, Morse & Co. in Beloit, Wis.

—o—

S. H. Wardell, works manager of the Detroit branch of American Brass Co., Waterbury, Conn., has been named director of mill operations for the entire company, succeeding **William M. Moffatt,** who was promoted to vice president in charge of manufacturing. Mr. Wardell will have headquarters in Waterbury.

—o—

John A. DeGroot, formerly of Pittsburgh, has been transferred to the San Francisco office of Westinghouse Electric Corp. and appointed to the post of assistant to the Pacific Coast district manager, **Charles A. Dostal,** Westinghouse vice president. Mr. DeGroot succeeds **W. J. Howell,** appointed assistant to the apparatus sales manager at Pittsburgh.

—o—

Wilbur D. Prescott has been elected assistant treasurer, and **Charles A. Dilley,** assistant secretary of Cleveland Graphite Bronze Co., Cleveland. Both men have served in various departments of the company, Mr. Prescott being at present budget director, and Mr. Dilley assistant to the president.

—o—

Stanley J. Retzlaff has rejoined Allis-Chalmers Mfg. Co., Milwaukee, as manager of sales to machinery manufacturers. He resigned as director of trade relations in 1948 to become vice president of Industrial Mills Inc., Milwaukee.

—o—

J. B. Neiman has joined U. S. Reduction Co., East Chicago, Ind. For the last 15 years Mr. Neiman has served as general manager of the aluminum department, Federated

HAROLD Q. NOACK

Appointed assistant to vice president-sales, Columbia Steel Co., San Francisco. Noted in STEEL, Aug. 22 issue, p. 56

Metals Division, American Smelting & Refining Co., and has been connected with the aluminum smelting industry for the last 38 years.

—o—

R. Russell Fayles, who joined Lukens Steel Co., Coatesville, Pa., in 1941 as open-hearth fuel engineer, and who subsequently became assistant to the open-hearth superintendent, has been named fuel engineer of the company, succeeding **Henry S. Hall,** resigned. Prior to his association with Lukens Steel Co., Mr. Fayles was for four years assistant fuel and power engineer at the Vandergrift Works, Carnegie-Illinois Steel Corp. and for one year special engineer at South Chester Tube Works, Chester, Pa.

—o—

Cochrane Corp., Philadelphia, announces appointment of **Samuel B. Applebaum** as manager of its Cold Process Water Treating Division. He is also vice president of Liquid Conditioning Corp., a subsidiary.

OBITUARIES...

Roy E. Hammond, 53, comptroller, General Motors Corp., Detroit, died of a heart attack Aug. 17. Mr. Hammond was made assistant comptroller of General Motors in 1944 and became comptroller in 1947.

—o—

Ralph S. Byers, 60, regional manager, central region, Motor Truck Division, International Harvester Co., Chicago, died Aug. 19. Associated with the company for 36 years, he was district manager since 1934.

—o—

Philip M. Guba, 62, manager of sales, eastern area, Carnegie-Illinois Steel Corp., subsidiary of U. S. Steel Corp., died Aug. 18 in New York, following an extended illness. He was manager of sales in New York for Donner Steel Co. before it was absorbed into Republic Steel Corp. in 1930. He first joined the United States Steel organization in 1933.

—o—

Morris S. Waisman, 65, president, Consumers Steel & Supply Co., Racine, Wis., died Aug. 3.

—o—

Robert J. Russell, sales manager, Lipe-Rollway Co., Syracuse, N. Y., died Aug. 10. He had previously been associated with H. H. Franklin Mfg. Co. for 19 years.

—o—

Robert A. Cory, senior partner in Cory-Carlton, Syracuse, N. Y., heating equipment firm, died Aug. 8. He also was vice president of Syracuse Wrench Co.

—o—

John L. Daly, a member of the sales department, Combustion Engineering-Superheater Inc., New York, died Aug. 16.

—o—

William G. Nee, 40, metallurgist and service engineer, Ferro Engineering Co., Cleveland, was killed in an automobile accident Aug. 5 near East Palestine, O. Before joining Ferro Engineering Co. he was employed by Republic Steel Corp. in Canton, O.

—o—

Dorsey G. Andrews, 85, president and founder of Andrews Hardware & Metal Co., Los Angeles, died Aug. 16.

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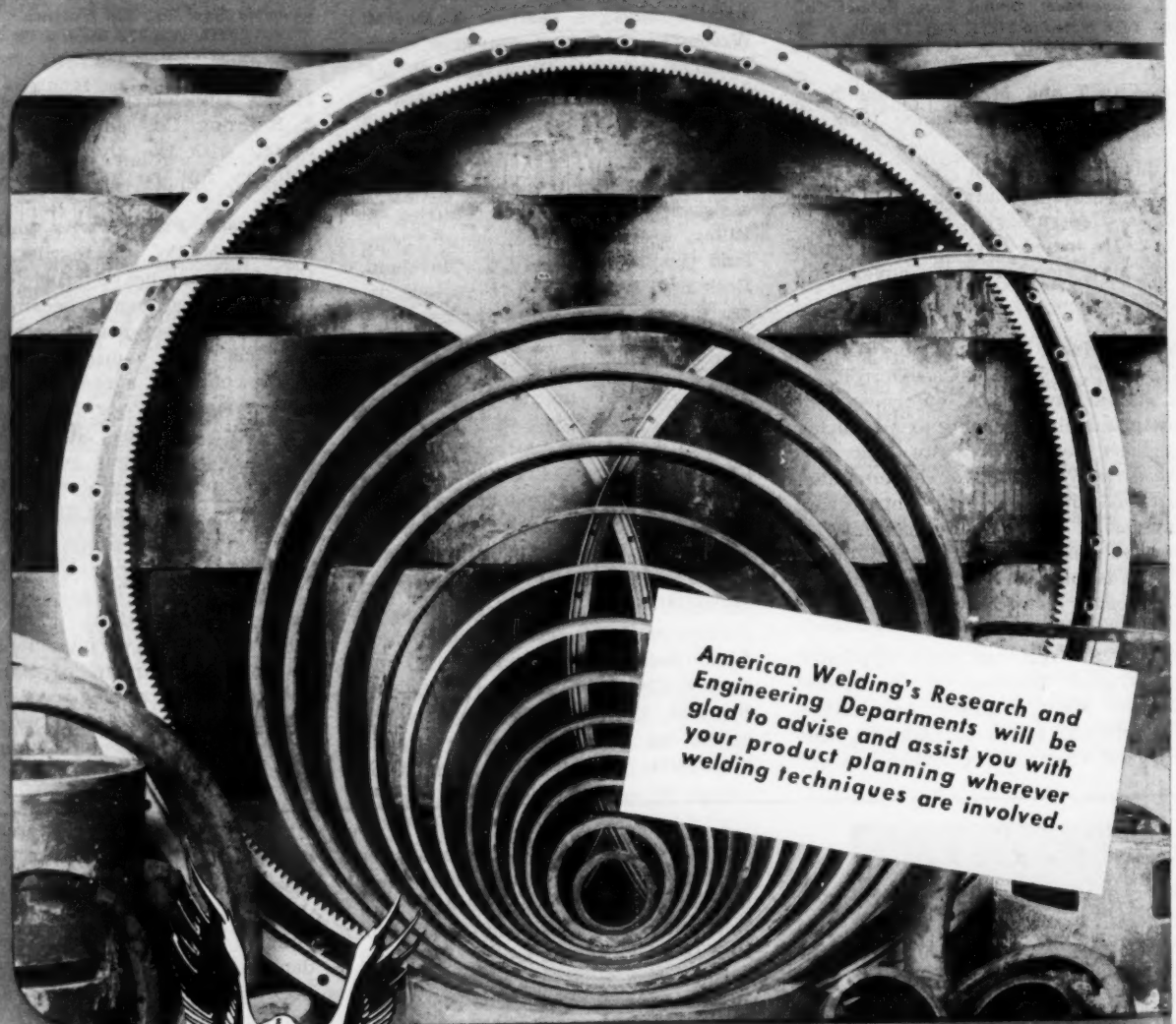

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Engineering News . . . AT A GLANCE

SOLVES "HOT" HANDLING PROBLEM—A conveyor belt of special rubber, compounded to handle hot loads at the basic brick plant of Permanente Metals Corp., Moss Landing, Calif., is reported still in action after 6 months duty—moving heavy loads of hot clinkers of chromite at temperatures ranging from 220 to 240° F. Belts used prior to the latest installed by B. F. Goodrich engineers resulted in expensive materials movement—they had to be replaced every 60 days during the first 2 years of the plant's operation.

MASS PRODUCES STAINLESS POWDER PARTS—Amplex Mfg. Co., Oilite Division, Chrysler Corp., Detroit, reports it is now mass producing finished machine parts from stainless steel powders. Among the first precision parts to be created from stainless is a cam for an application in which contamination cannot be tolerated. Although the cam is only about 1 inch long, the Chrysler subsidiary recently quoted on a part with a 24-square-inch surface area. According to the company, the part's inherent tensile strength—33,000 pounds per square inch—permits weight saving through use of thinner sections. Each part maintains its strength at both low and high temperatures.

MEETS SUB-ZERO REQUIREMENTS—Fulfilling extraordinary engineering requirements of sub-zero service at operating temperatures as low as minus 423° F, a new alloy steel, reported recently by Lebanon Steel Foundry, Lebanon, Pa., is believed to have particular usefulness for applications in meeting exacting requirements of oil, chemical and other processing industries. An austenitic cast ferrous alloy containing 19.50 per cent chromium and 9 per cent nickel among other alloying constituents, the metal already is being employed effectively in producing steel castings for pressure equipment in storage facilities for liquid oxygen used as a propellant for rocket engines. The alloy also can be easily welded by either gas or electric processes without need of subsequent heat treatment.

STEPS UP CHECKING—Production line testing of steel for small arms components was stepped up by some 1000 units per hour with the use of a GE magnetic comparator in the New Haven, Conn., plant of Winchester Repeating Arms Co. The setup is reported to compare rods, bolts, springs, and small fabricated parts with a preselected standard of the same size and shape to detect a difference in composition, heat treatment or other characteristics which alter resistivity or magnetic properties. According to company engineers, steels the hardness of which differs by as little as 2 points Rockwell are distinguished by the testing procedure.

EXTRUDES CARBIDE TUBES—Perfection of several processes recently now enables Kennametal Inc., Latrobe, Pa., to manufacture successfully by extrusion methods cemented carbide tubes as small as 1/32-inch outside diameter with an inside diameter of 0.004-inch, and as large as 9/16-inch outside diameter with a wall thickness of 1/16-inch. Tubes are made in two types—one as a straight tungsten carbide suitable for parts subjected to abrasion at normal temperatures, the other is titanium carbide. Chief distinguishing property of the latter is that it withstands corrosion and abrasion at elevated temperatures which rapidly disintegrate cast alloys.

TOO MANY STEELS—In spite of the excellent work done by producers prior to the war in materially reducing the number of standard grades of steel, many people feel that there are still too many steels listed. Consumers, according to Muir L. Frey, Allis-Chalmers Mfg. Co., are almost entirely responsible for this condition and it is within their power to remedy it. This, he points out, can be done by careful consideration of requirements, and by a willingness to make the necessary changes—usually small—that will enable the more common items to be used. (p. 60)

THE GREASE SIDE—Use of grease on machine tools still is an extremely controversial subject, it is found. Before the development of the petroleum products industry—and the machine tool industry as well—lubrication was a rather simple process reduced to a decision between the use of water, whale oil or bacon rind. Now with the many refinements incorporated in machine tools, and the many specialized lubricating products available to service delicate working components of the machines, the decisions to be made are not so simple. Some machine tool users might benefit from some of the suggestions set forth. (p. 64)

LESSER OF TWO EVILS—Although cost of suitable identification media and time and labor needed for their efficient use are by no means cheap, their cost is infinitely less than those brought about by waste, scrappage and production delays. Identification, it is pointed out, is a continuous process with complexities without number — but not without solution. It is suggested that ideally, the mechanics of identification should be vested in the hands of one person of final authority on all matters bearing on the problem. (p. 66)

ONCE "BIG BUSINESS"—At one time demand for rails was so great that a large number of comparatively small rolling mills could not supply the need. In 1874, it is pointed out, 69 mills were producing the vital railroading product. Today, the rails are being produced by only about 11 mills. Some of these mills are used entirely for rail rolling whereas others produce structural and other shapes as well as rails. (p. 74).

Steel S

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PROBLEM of quality classification in steels is at best difficult because steel quality is in most cases relative, that is, the important items of quality are determined by the end use of the material. Certain end uses become well defined, for example, forgings or gear steels or sheets for deep drawing. Over the years, a general understanding of the quality required by such applications and implied by the term is built up in the minds of both producers and consumers and it has been accepted trade custom that the mill practice used will be such that the finished product will possess the qualities necessary for successful end use. In other words, end use determines the necessary quality; mill practice is the means used to produce the necessary quality.

Quality Classifications—In 1930, there were three named quality classifications of carbon bars and semi-finished steels: Commercial quality, forging quality and several special qualities. The definitions of these were not particularly clear and this fact coupled with the pressure of a buyer's market gradually broke down the use of the designations so that in the late 30's and even up to the change in December, 1946, it was generally understood that these steels would be furnished to do the job. There remained, however, certain extra cost special requirements commonly accepted in the trade. The 1946 change reinstated named quality classifications for carbon bars. They are merchant quality and special quality. Any one of several listed additional restrictive requirements may be placed on special quality, thus giving a third classification. If more than one restrictive requirement is imposed, a fourth classification, other restrictive requirement quality, is involved.

Special quality may be best described by saying that it comes fairly close to the old forging quality that we all understood. The definition of this bar quality is based partly upon end use and the familiar general terms are used. So far we are on familiar ground but here the similarity ends. The opening sentence of the paragraph defining special quality (AISI manual No. 8, page 30) states: "Special bar quality hot rolled carbon steel bars should be specified for purposes for which merchant bar quality is not suitable." Surely a better example of the negative approach would be hard to find!

This immediately raises the question: What is merchant quality? To date, it has not been satisfactorily answered by anyone and it remains one of the most perplexing questions of the day in steel application.

By definition, merchant quality is a rolled bar product made at the producer's option from rimmed, capped or semikilled steel and cast into open-top molds. No conditioning other than salvage conditioning is contemplated during the process of manufacture. This definition covers the general scheme of manufacture but it fails to define the product in terms of use—the very thing in which the consumer is most interested. Merchant quality is without question "mine run" steel. However advantageous this may be from a producer's standpoint, it creates some very difficult problems for the user because he can never be certain of receiving a uniform product.

Permissible Variations in Check Analysis—In 1941 SAE had adopted the AISI procedure of using relatively close carbon limits based on ladle analysis for chemical specification purposes together with allowable variations from the specified limits when check

TABLE I
PERMISSIBLE VARIATIONS FOR CHECK ANALYSIS
CARBON

Before December, 1946	Per Cent ±	After December, 1946	Per Cent ±
To 0.30 Incl.	0.01	To 0.25 Incl.	0.02
Over 0.30 to 0.75 Incl.	0.02	Over 0.25 to 0.55 Incl.	0.03
Over 0.75	0.03	Over 0.55	0.04

TABLE II
PERMISSIBLE VARIATIONS FOR CHECK ANALYSIS
CARBON

	Before Dec., 1946 SAE 1020	Before Dec., 1946 SAE 1035	After Dec., 1946 SAE 1020	After Dec., 1946 SAE 1035
Ordered Range—Ladle	0.18-0.23	0.32-0.38	0.18-0.23	0.32-0.38
Allowable Range on Check Analysis ...	0.17-0.24	0.30-0.40	0.16-0.25	0.29-0.41
Former SAE Range..	0.15-0.25	0.30-0.40	0.15-0.25	0.30-0.40

TABLE III
NOMINAL CHEMICAL RANGES

SAE Number	Carbon	Manganese
1030	0.28-0.34	0.60-0.90
1033	0.30-0.36	0.70-1.00
1034	0.32-0.38	0.50-0.80
1035	0.32-0.38	0.60-0.90
1036	0.30-0.37	1.20-1.50
1038	0.35-0.42	0.60-0.90
1039	0.37-0.44	0.70-1.00
1040	0.37-0.44	0.60-0.90
1041	0.36-0.44	1.35-1.65
1042	0.40-0.47	0.60-0.90
1043	0.40-0.47	0.70-1.00
1045	0.43-0.50	0.60-0.90
1046	0.43-0.50	0.70-1.00
1050	0.48-0.55	0.60-0.90

TABLE IV
NOMINAL CHEMICAL RANGES

SAE Number	Carbon	Manganese	Sulphur
Open Hearth			
1109	0.08-0.13	0.60-0.90	0.08-0.13
1114	0.10-0.16	1.00-1.30	0.08-0.13
1115	0.13-0.18	0.60-0.90	0.08-0.13
1116	0.14-0.20	1.10-1.40	0.16-0.23
1117	0.14-0.20	1.00-1.30	0.08-0.13
1118	0.14-0.20	1.30-1.60	0.08-0.13
1119	0.14-0.20	1.00-1.30	0.24-0.33
1120	0.18-0.23	0.70-1.00	0.08-0.13
1126	0.23-0.29	0.70-1.00	0.08-0.13
1132	0.27-0.34	1.35-1.65	0.08-0.13
1137	0.32-0.39	1.35-1.65	0.08-0.13
1138	0.34-0.40	0.70-1.00	0.08-0.13
1140	0.37-0.44	0.70-1.00	0.08-0.13
1141	0.37-0.45	1.35-1.65	0.08-0.13
1144	0.40-0.48	1.35-1.65	0.24-0.33
1145	0.42-0.49	0.70-1.00	0.04-0.07
1146	0.42-0.49	0.70-1.00	0.08-0.13
1151	0.48-0.55	0.70-1.00	0.08-0.13

TABLE V
CHEMICAL COMPOSITION LIMITS, PER CENT

AISI Number	Carbon	Manganese	Chromium
5120	0.17-0.22	0.70-0.90	0.70-0.90
5130	0.28-0.33	0.70-0.90	0.80-1.10
5132	0.30-0.35	0.60-0.80	0.80-1.05
5135	0.33-0.38	0.60-0.80	0.80-1.05
5140	0.38-0.43	0.70-0.90	0.70-0.90
5145	0.43-0.48	0.70-0.90	0.70-0.90
5147	0.45-0.52	0.75-1.00	0.90-1.20
5150	0.48-0.53	0.70-0.90	0.70-0.90
5152	0.48-0.55	0.70-0.90	0.90-1.20

From data that was presented before the 1949 SAE annual meeting in Detroit.

By MUIR L. FREY
Assistant to General Works Manager
Tractor Plants
Allis-Chalmers Mfg. Co.
Milwaukee

Specifications

CONSUMER'S STANDPOINT

In spite of close co-operation between AISI and SAE, several points in steel quality classification, permissible variations in check analysis and other matters remain to be settled. While present systems for specifying steels are fairly adequate, several refinements suggested by the author are worth careful consideration

analyses were made. AISI, in the December, 1946 changes, increased by one point of carbon either way the allowable variations in check analysis for carbon steels, thus making the total variation plus or minus two points for low carbon steels and so on through the various carbon levels. The provision that any heat may not vary both above and below the specified range was retained. Tables I and II show the change.

It applies only to semikilled and killed steels since rimmed and capped steels are not subject to check analysis. At the same time, the break from two to three points allowable variation was lowered from 0.30 to 0.25 per cent carbon and the break from three to four points was lowered from 0.75 to 0.55 per cent carbon. Again taking our example of an SAE 1020 steel with a specified ladle of 0.18 to 0.23 per cent carbon, the new check analysis limits require that a carbon range of 0.16 to 0.25 per cent be accepted on two or more heats. This is a total spread of 10 points, just one point less than the old SAE range of 11 points which most consumers, particular about their heat treating operations, felt was too wide.

Medium Carbon Steel—The situation with respect to medium carbon steel is even more disturbing. Take for example the case of SAE 1035. The ladle range is 0.32 to 0.38 per cent carbon or seven points. The permissible check analysis variations in the carbon range 0.25 to 0.55 per cent is now plus or minus three points, so that we must accept SAE 1035 from 0.29 to 0.41 per cent carbon, a range of 13 points on two or more heats. This is two points more than the old SAE range of 0.30 to 0.40 per cent carbon which allowed a total of 11 points. Anyone familiar with the wide variation in behavior exhibited by this and similar steels even with good grain size and other deoxidation control will agree that such a carbon spread adds materially to the difficulty of securing uniform behavior in processing. One solution to the problem is to specify a restricted carbon range at increased cost. In considering these matters, it must be remembered that carbon steels are extremely important to most producers because of their wide variety of application.

This matter has been the subject of much discussion in the technical committees and the producers have presented data to show that the wider limits are essential for some mills, depending principally upon the type of steel made and the ingot mold used. These technical facts cannot be disputed but it should be pointed out that if a mill is not so equipped, it should not attempt to make high quality carbon steels for heat treating. The producers have very properly asked the consumers to present evidence of cases where the wider carbon limits are working a hardship.

Statistically, since the complaint is about the extremes of the range, the number of cases in which the producers will take advantage of the widened limits will probably not be large. The limited data available at the present time indicate that the effect of the wider carbon spread is in many cases overshadowed by the ever-increasing amount of residual alloy found today in all grades of steel. In the absence of sufficient performance data showing the effect of carbon alone, a correct decision as to the detailed effect of the wider carbon limits may have to wait until the residual alloy is brought under control.

Technically, carbon is the most powerful hardening element in steel and any relaxation of its control is a very serious matter. From an economic standpoint, it seems that those who insist that carbon steels shall be degraded and made less precise in performance are following a course counter to their own best interests. Not only are the consumers hurt immediately when they must use alloy steel where carbon steel should serve but we must all keep in mind that even now this country is a "have not" nation insofar as certain important alloying elements are concerned, notably chromium, nickel, manganese and vanadium. Better performing carbon steels for wider use and more precise application are a part of the solution to this problem.

Standard Composition Tables—Another matter to which considerable attention has been recently given is the matter of lists of numbered steels for commonly used steel products other than bars. The tables of numbered carbon steels now published in the SAE handbook and the corresponding AISI tables cover

only semifinished materials, bars and rods. The SAE tables for alloy steels do not state what products are covered but the corresponding AISI tables are limited to semifinished products and bars. Some time ago, the SAE proposed to the AISI that similar tables be prepared to cover sheet and strip, hot and cold rolled, plates and structural shapes. After a considerable amount of work on their part, it appears that the necessary tables will shortly be forthcoming.

Two good reasons exist for adding these tables; first, regardless of end use, a convenient method is needed for specifying the grade of steel required; use of the SAE numbering system is logical. Second, the use of such products for heat treating purposes is increasing and one of the added requirements is closer control of behavior. By placing the classification of these steels on the same basis as bars, it is felt that a significant step has been taken. It is to be hoped that eventually we will be able to have one table covering the standard composition ranges for all products.

Another product which needs the same type of treatment is carbon steel mechanical tubing. Since the product from which seamless mechanical tubing is made starts out as a bar or billet known as a tube round, it would seem logical to find that the specifications covering these products would also apply to tubing. Instead, we find that although the same numerical system is used for designating grades, only a limited number of the carbon bar specifications are available as tube and, even in those cases, the ranges of chemical composition are different. Tubing is specified on a 10-point carbon range and this range covers the complete spread allowable on check analysis.

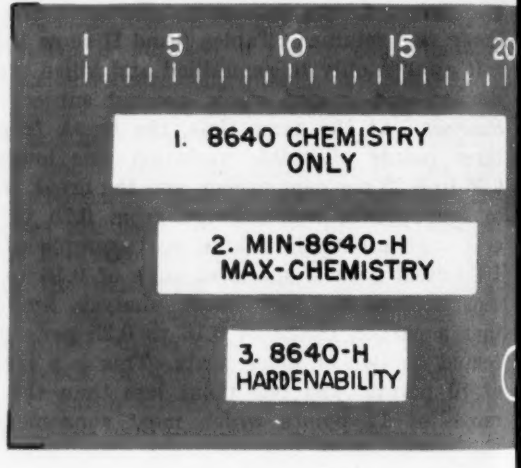
Evidently grade classifications of tubing have not kept pace with those used for bars. It is to be hoped that in the near future, tubing classifications may be brought under the same general scheme as applies to bars, not only with respect to carbon range and the manner of specifying it but also with respect to the manner of securing the quality classifications.

These problems do not arise in the matter of seamless alloy steel tubing because there the grade classifications, chemical ranges and quality requirements follow the same pattern as now used for alloy bars and are adequately defined by existing specifications.

Too Many Steels—In spite of the excellent work done by the producers just prior to the war in materially reducing the number of standard grades of steel, many people are of the opinion that there are still too many steels listed. An examination of the list of either SAE or AISI bears out this contention. In Table III is shown a portion of the carbon steel list from SAE 1030 to SAE 1050, inclusive. In order to simplify the table, only the carbon and manganese ranges are shown. Note first the very closely spaced and widely overlapping specifications for carbon as illustrated by 1033 and 1034. Second, in the case of 1034 and 1035, the specification for carbon is identical, but the manganese range for 1035 is shifted upward 10 points above that for 1034. A similar shift in manganese range, carbon being identical, exists between 1039 and 1040. Similar instances occur in the case of 1042 and 1043 and again in 1045 and 1046. Other instances exist in the case of 1018 and 1019, of 1021 and 1022 and of 1054 and 1055.

An even more confusing situation exists in the resulphurized steels. Table IV is a reproduction of the open hearth portion of the SAE list. It will be seen that grades 1116 through 1119 are very closely spaced with respect to both carbon and manganese content. There are four steels with identical carbon but varying manganese, two of which have closely spaced manganese ranges. The sulphur content varies in these four steels from the normal 0.08 to 0.13 per cent to the extremely high 0.24 to 0.33 per cent. The AISI table carries six more steels than are shown in the SAE table, five of them being in the low carbon, low manganese grade below 1113. Only one of these, 1109, is listed by the SAE.

Alloy Steels—This situation is not confined to the carbon steels. Table V shows the 5100 series of alloy steels. Here we have 5130 and 5132 and 5132 and 5135 closely spaced and widely overlapping so far as carbon content is concerned. We have 5150 and 5152 which differ by two points of carbon on the top side of the range and we have 5147 and 5150



closely spaced and widely overlapping in both carbon and manganese.

It is granted that for purposes of precise processing control or particular engineering requirements and large volume production, closely controlled material is essential. But further consideration indicates that if one of the pairs of steels is satisfactory, the other one should be also, except in special cases. It is believed that in many cases a minor change in processing or perhaps a minor change in the type of thinking applied would eliminate the necessity for these very closely spaced items. Of the two obstacles, perhaps the latter is the more difficult to overcome.

In the case of carbon steels, the additional factor of cost enters. It so happens that there is a break in the manganese extra at 0.90 per cent manganese. Some processors feel that they must have more manganese and are willing to pay for it. Others feel that the need for additional manganese can be overcome either through a happy combination of the size of section and of processing equipment or are willing to make the necessary changes to enable the lower

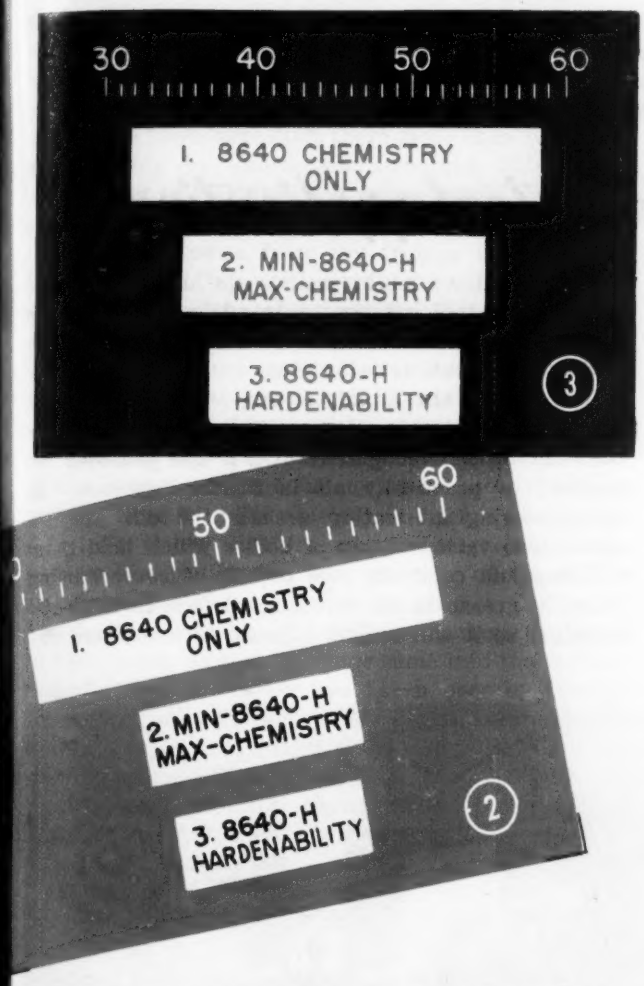


Fig. 1—Difference in distance on Jominy bar at a hardness level of Rockwell C 45 when 8640 is purchased to narrow chemistry limits and when purchased on a hardenability basis with widened composition limits

Fig. 2—Range in Rockwell hardness values at a given distance on the Jominy bar, in this case four sixteenths, for the two methods of specification

Fig. 3—Similar data as that given in Fig. 2, for a Jominy distance of eight sixteenths

manganese range to perform satisfactorily.

Consumers Responsible—The consumers are almost entirely responsible for this condition and it is within their power to remedy it. This can be done by careful consideration of requirements and by a willingness to make the necessary changes, usually small, that will enable the more common items to be used. These grades can be identified usually by those numbers which end in "0" or "5" in the alloy steels. In carbon steels, the identification of the commonly used grades is not so easy. The producers have little control over the matter because when they are faced with a demand for a nonlisted steel in sufficient tonnage, they will eventually acquiesce to the addition of another numbered steel to the list. The SAE Iron and Steel Technical Committee faces the same problem. Requests are constantly being made for the addition of more steels to the list based upon a substantial but still relatively limited usage.

An attempt has been made to combat this condition by industry-wide producer surveys of the tonnage furnished in various grades. It is hoped that these surveys will show, in addition to the increasing use of certain grades, a decreasing use in others, so that grades falling into disuse can be removed. Until this survey is completed, the users can help the situation materially by policing their list of usage to eliminate those materials which are least used and special. The industry surveys are, however, the means through which this policing can be made really effective.

Availability of Steels—Such surveys, if kept up to date, would serve other useful purposes. First, they would clearly indicate to the user the fact that the SAE-AISI lists now contain not only steels generally used but also many of limited usage. It is believed that this condition is not clear to many people and that, on the contrary, they think that all listed steels are equally available. Second, the consumer would be kept advised of trends in usage and thus be in a position to revise specifications accordingly. It would probably not be possible to advise all users but certainly the larger ones could be kept informed.

Such inquiries as have been made into this matter indicate that the availability, that is to say the customer usage of steels, varies with the producing district. An industry-wide survey should be further subdivided by major producing districts in order for the information to be most useful in guiding customer selection. Such a survey is a task of considerable magnitude but it is hoped that in spite of this handicap, the producers can arrange to supply the trade with this information.

Method of Ordering Steels—In addition to the problem of exactly what steel to select and to order, there is the additional problem of how to order it. As far back as the time when chemical composition as normally determined was considered sufficient description of the attributes required in steel, there was the problem of placing necessary additional information on the purchase order such as: Surface finish; the matter of length and multiples; other special requirements such as annealing, pickling, oiling, machine straightening and so on. There may have been a quality designation of some kind even though it represented nothing more than a term agreed upon between the producer and consumer. Such necessary additional information is essentially process information and much of it is not essential to either engineering or metallurgical requirements.

That happy state of affairs has long since passed. We have, as a result of more exacting product design and shop processing, been developing through the years more precise definitions and tests for the particular attributes required in steel. These items are, in contrast to the ones just discussed, principally of engineering and metallurgical concern. The first one in general use was grain size and we now have in the case of carbon steels the added complication of bar quality classification and silicon content. Such items as these naturally form a part of a general specification for a material that may be applied to a number of parts.

It has been pointed out that the SAE-AISI lists do no more than classify (*Please turn to Page* 88)

GREASE LUBRICATION

... effective in machine tool applications

USE of grease on machine tools is an extremely controversial subject. Regardless of specific end use of machines, fundamentally, moving parts of the machine that do the work are lubricated. These parts can be classified into six types of basic mechanisms: Bearings, gears, chains, V-ways and slides, cams and eccentrics, hydraulic systems. All of these are modified by the proportion-relationship and conditions under which they are forced to operate. Having established these fundamentals, a yardstick can now be applied to determine other basic considerations.

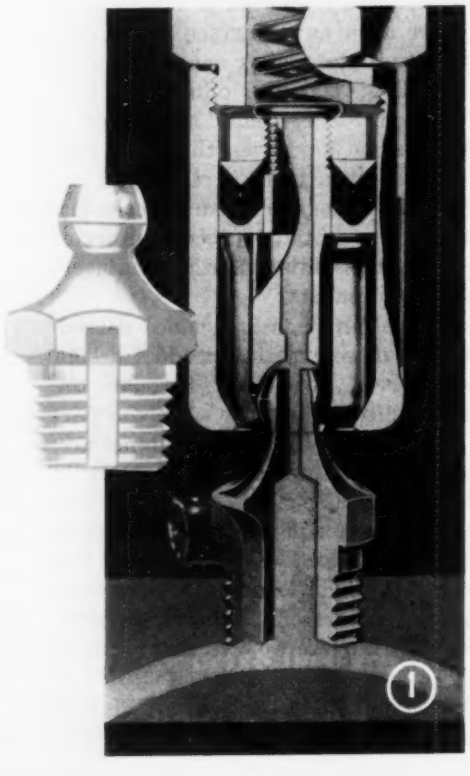
Before the development of the petroleum products industry, and we might include the development of the machine tool industry, lubrication was a rather simple process reduced to a decision between the use of water, whale oil or bacon rind.

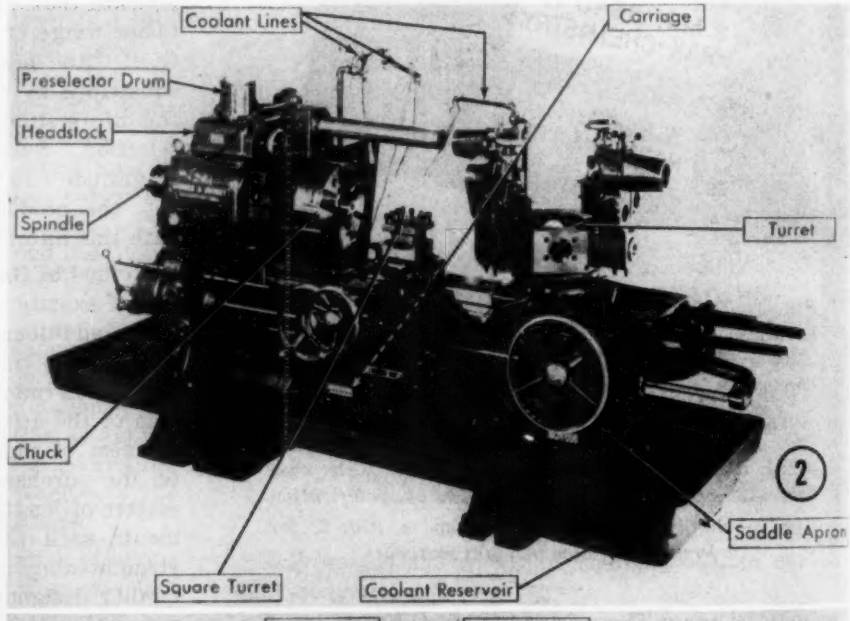
Sponge Plus Oil Equals Grease—Petroleum development changed this picture. The value of oil as a lubricant is well recognized. Oil is the principal ingredient of practically all lubricating greases. In manufacturing lubricating greases the oils are absorbed into various types of bodies which hold them in a nonfluid condition, the object, of course, being to apply grease to the working surface in a plastic condition so it will remain (*Please turn to Page* 90)

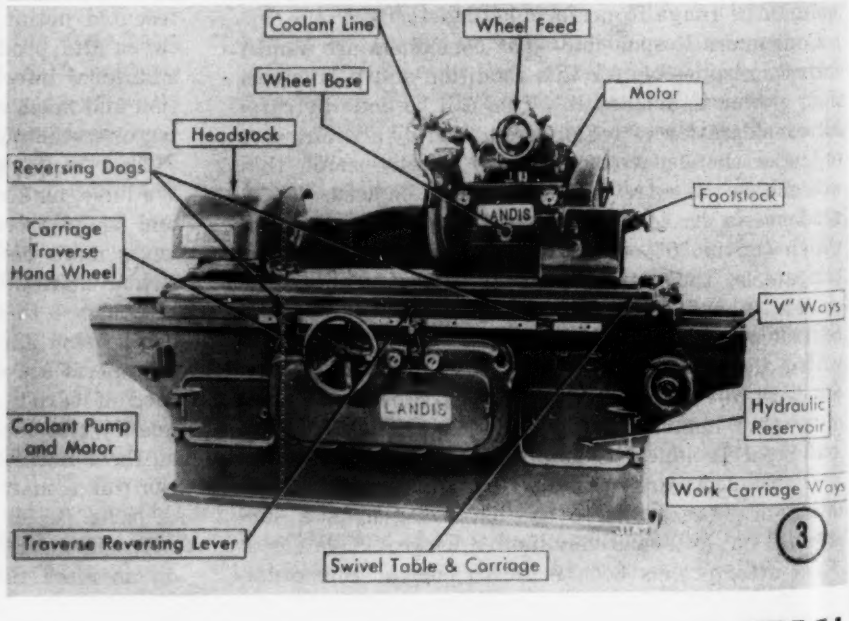
By E. RALPH HARRIS
Alemite Division
Stewart-Warner Corp.
Chicago

Fig. 1—Fitting developed to prevent excessive lubrication of motor bearings, causing lubricant to be expelled through a slot or port in the fitting so that lubricant backs up when the bearing area is approximately 40 per cent filled

Figs. 2 and 3—Two of the many machines on which grease lubrication has been employed with good results, at several points







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SEEN AND HEARD IN THE Machinery Field

By GUY HUBBARD
Machine Tool Editor

CINCINNATI BICKFORD'S 75TH: It is not generally realized that Cincinnati not only is the greatest machine tool building center of the world, but also one of the oldest centers of that industry. Various kinds of machine tools were built there more than 100 years ago—notably by James and Jonathan Niles—who later moved to Hamilton and whose family name still is perpetuated in that of Niles-Bement-Pond Co.

Word now comes from my friends at Cincinnati Bickford Tool Co., that during the month of September they will be observing the 75th anniversary of this internationally-known builder of upright drills, jig boring machines and radial machines. About 20 years ago, the late August H. Tuechter, one of the moving spirits of Cincinnati Bickford from 1887 until his death on May 17, 1947, went into details with me on the history of the company as he knew it and as he had "lived it". This history in brief is as follows:

In 1874, Henry Bickford, who had learned his trade in New Hampshire and who was one of the skilled mechanics in the J. A. Fay & Co. shop in Cincinnati, launched his own upright drilling machine company. In 1887, when August Tuechter came into the picture, this Bickford enterprise was taken over by Charles Hoefinghoff and Anthony and George Kerkhoff, who operated as Bickford Drill Co. Eventually this name was changed to Bickford Drill & Tool Co. at which time the Kerkhoff interests were taken over by August Tuechter and Anton Mill—who shortly afterward were joined by L. G. Keck.

In 1894 this group took over the Universal Radial Drill Co., which had been started by George A. Gray (founder of G. A. Gray Co.) who had invented and patented the column-type radial drill in 1869 when he was with the Niles Tool Works—then located in Cincinnati. Associated with Mr. Gray in the Universal enterprise were Charles Hoefinghoff, P. G. March (founder of Cincinnati Shaper Co.) and other pioneer machine tool men of Cincinnati.

Upon the death of Mr. Hoefinghoff, August Tuechter withdrew from the Bickford company and in 1898 with Sherman C. Schauer organized the Cincinnati Machine Tool. Mr. Schauer was a "graduate" from Hamilton Machine Tool Co., Hamilton, Ohio. This Tuechter-Schauer partnership bought out an upright drill business which in the meantime had been established by Anthony and George Kerkhoff.

Then, in 1909, they took over the Bickford Drill & Tool Co., thus completing a cycle and forming the present Cincinnati Bickford Tool Co. Associated with Messrs. Tuechter and Schauer in this enlarged enterprise were Henry McCoy Norris, David C. Klausmeyer and George P. Gradolph.

Following the death of Mr. Tuechter, in 1947, George P. Gradolph—now the "elder stateman" of the company—became chairman of the board and Ozni E. Schauer became president and general manager. Other officers now are Neil C. Schauer, vice president and sales manager; L. Lee Schauer, vice president and chief engineer; Paul E. Heckel, secretary; and C. Charlton Slete, assistant treasurer .

To these men and their fellow workers go my hearty congratulations for perpetuating so actively and so successfully one of the oldest and one of the best and most favorably known machine tool building companies in America. I know that a host of others will join with me in expressing the same sentiments on Cincinnati Bickford's 75th anniversary.

"LONDON TIMES" AIDS CAUSE: General opinion here in America is that *The Times* of London, England, represents an island of conservatism in a sea of socialization. Be that as it may, that great newspaper this summer has come to the aid of the British machine tool industry in a way far beyond anything which ever has been done by any metropolitan daily in behalf of our own machine tool industry.

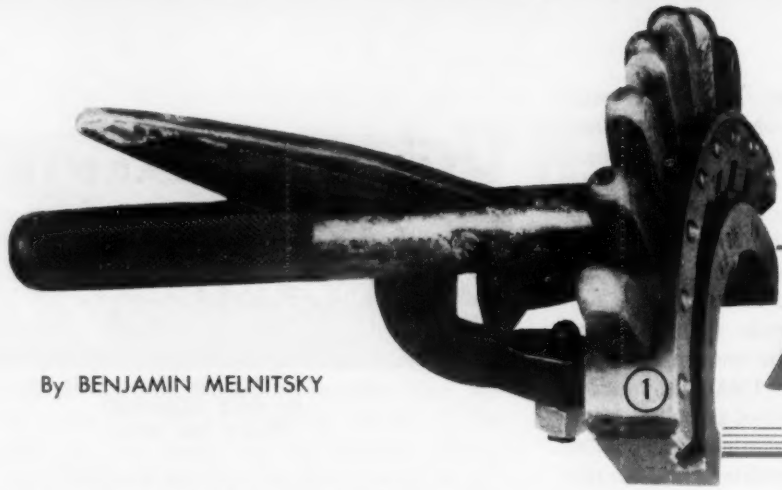
I am indebted to E. L. Shaner, editor-in-chief of STEEL, for a copy of a remarkable book entitled *The Times Survey of the British Machine Tool Industry*, which he in turn received from a friend in England. Published in co-operation with the British Machine Tool Trades Association, this 10½ x 14-inch, 72-page volume certainly goes "all out" for an industry to which only the trade press in American ever has accorded comparable recognition.

The book gets off to a fast start with this statement: "The machine tool industry was born in Great Britain. By 1850 makers in the United States were coming into the field not merely as imitators but with important innovations based on the characteristic developments of mass production industrial methods which even at that early date were becoming conspicuous.

"Inevitably machine tool making became international as the industrial revolution became international. But British industry, with its long and distinguished traditions, has been able to assimilate most of the experiences of its rivals while maintaining its own individual traditions and vitality, and it has remained one of the main suppliers of machine tools to the rest of the world."

A number of my friends in the American machine tool industry have been complaining lately that their export business is not up to expectations. They have strong suspicions that the British competitors are getting orders which rightfully should be awarded to American companies because of our advanced designs.

After studying this *London Times* book, I am inclined to think that some of our American builders are underestimating the engineering ability of the British machine tool builders. At least they are underestimating their aggressiveness. Any capital goods industry which can get the *London Times* solidly behind it, certainly is not to be sneezed at as a competitor in world markets.



HOW TO Identify

By BENJAMIN MELNITSKY

Fig. 1—Device for stamping serial numbers or other identification marks on tubing, axles, round bars where marking is required around the outer circumference. Courtesy M. E. Cunningham Co.

Fig. 2—Identification in warehouse is facilitated by painting ends of bars with color code; sizes are indicated on the rack itself. Courtesy Republic Steel Corp.

Fig. 3—At Meadville plant of National Bearing Division, American Brake Shoe Co., raw materials for casting shop are stored in movable boxes whose contents are identified by tags attached to face of container

LUXURY of waste has no place in the present buyer's market which is characterized by competition, constricted markets and consumer cost-consciousness. Yet, in their efforts to limit needless inefficiency, many plants emulate the machinist who wears shatterproof goggles, safety gloves, suitable work clothes, canvas sneakers. Seeking hither and yon for cost-cutting means, more than a few concerns overlook one of the most significant forms of industrial waste —faulty identification of engineering materials.

Hardly an annual financial statement appears which, in one way or another, does not bear on its debit side the mal-effects of this factor. The loss may be the direct one, wherein materials need be discarded due to lack of identification. Or it may be the far greater indirect loss—manhours wasted in the machine shop working parts from incorrect stock, in the storesroom seeking to identify materials, in the

Clear, accurate identification of forgings, castings, tubing, bar stock and parts in process can result in significant production economies

Engineering Materials

office adjusting records. Throughout industry, poorly identified materials add needlessly to the burdens of firms already weighed down by problems far more vital.

Insuring adequate identification, like growing hothouse orchids, requires unending surveillance. From the moment of receipt at the railroad siding, the handling, storing, and production cycle for engineering materials must be shadowed by a complex cycle of identification. Although the cost of suitable identification media and the time and labor needed for their efficient use are by no means cheap, their cost is infinitely less than those brought about by waste, scrappage and production delays. In this sense, identification measures can be compared to insurance premiums.

Just as different industrial hazards call for varying types of insurance policies, so too, each class of engineering material requires different identification means. The raised numerals formed during the foundry process are excellent for cast parts but of no significance for bar stock, sheet, strip, and the like. The color code painted on bar ends has negligible worth for most other engineering materials.

Factors to be identified are also variable. Certain materials require identification of chemical composition; whereas others may need to have identified such factors as size, nature of heat treatment, part number, specification number. A concern using but one grade of bar stock does not have the same problem as a firm with a wide variety. A centralized stockroom has an identification problem entirely different from that of a decentralized storage area.

Mechanics of Identification — The complexities of identification are without number, but not without solution. Ideally, the mechanics of identification, should be consolidated in the hands of one person with final authority on all matters which have bearing on the problem. Identification is a continuous process. The responsibility for part numbers on castings, color codes on bar stock, etc., cannot rest in one department. The identification of bar stock, to take but one example, involves not only the storesroom but also the machine shop, the receiving department, the heat treat room, the plant transportation service and others. As with other company-wide matters, the procedures for identifying engineering materials should be the subject of a conference at which all interested departments are fully represented.

From such a conclave should come forth: (1) Standard identification procedures and practices, (2) delineation of authority and responsibility, (3) methods for supervising identification of engineering materials, and (4) establishment of means for periodically checking the efficiency of the program. Items (2) through (4) are normal company practice and require no more than this brief mention. The first item, however, does call for further elaboration.

Standard methods for identification will, logically, vary among different concerns; hence, no "standard" standard can ever be proposed. There are, however, certain factors of general applicability.

Genesis of the identification problem occurs as the motor truck pulls up to the receiving platform or the freight car rolls into the plant's rail siding. If receiving department employees are negligent, they may nullify all subsequent identification measures. Should the checker receive B1112 steel as B1113, it is entire-

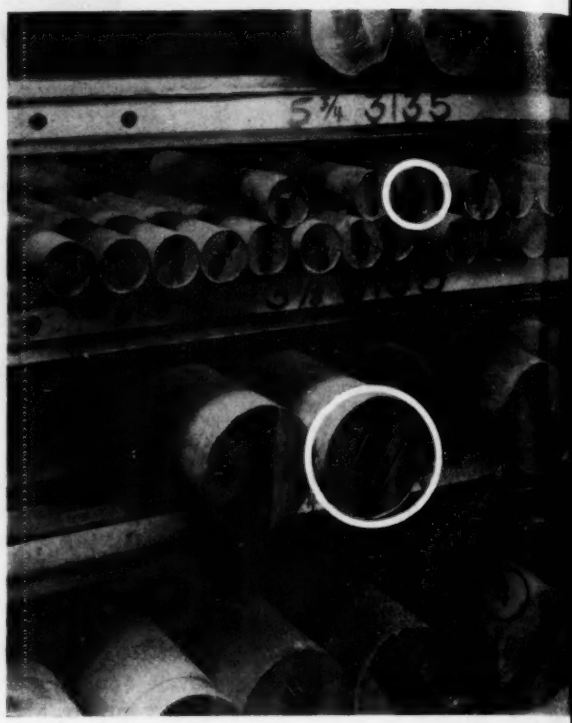
ly possible that the bars will be delivered to stores and there painted the color assigned to B1113, stamped with this specification number, and then placed in racks containing older shipments of B1113 steel. It can be seen that, in such a case, every measure taken after receiving serves only to make increasingly difficult detection of the error. For this reason, the first consideration has to do with the receiving department and actions taken therein. To insure accurate identification, the following measures merit consideration:

Identify Incoming Materials—It might be argued that the individual concern has little control over this factor since "it's up to the vendor." Yet, facts of present-day industrial life indicate otherwise. Frequently, indifference on the part of consignees accounts for shipments made without adequate packing slips and other means for identification. If the time is taken to indicate, on purchase orders and through correspondence with vendors, the precise manner in which shipments of goods are to be identified, it will be found that horrible examples of faulty identification by vendors will soon disappear.

A sound system of identification for crated and boxed materials entails the following: (1) Packing slip enclosed in container and location of slip indicated by exterior marking. If there is more than one case in the shipment, the one with the packing slip should be marked in some special manner. Painting diagonally opposite corners of the crate in contrasting colors is one method used widely in Britain. If duplicate slips are to be enclosed in all containers, they may be placed on the outside of each box under a metal plate. (2) Items which of themselves can not be identified should bear a small label on which is noted, in waterproof ink, such information as manufacturer's name, drawing or part number, stock number, manufacturer part number, part name and other information deemed essential.

For loose materials such as bars, forgings, etc., the vendor should be required to mail a packing slip prior to shipment or enclose a slip, suitably protected, with the shipment. For castings and forgings, the consignee should specify not only size and nature of markings on pieces but, as far as possible, the location of these markings. If several shipments of castings carry the part number on different sections of the cast part, there will be delay in receiving and the ever-present possibility that the number will be overlooked. Painting ends of bars with specified colors, impression stamping, stenciling information—these and other means of identification should be specified. The added cost of so doing usually is a small one; in terms of resultant savings, the expense is inconsequential.

Identification Facilitated—The fact that a vendor has taken the trouble to paint bar ends may be of no value to the checker unless he knows the meaning of the color code for bar stock. Unless the receiving department is fully aware of measures taken by suppliers to identify materials, nothing is gained. For this reason the department should have on hand duplicate copies of purchase orders, letters, and other correspondence concerning the shipment. With the many



low-cost duplicating machines now on the market, there is no justification for failure to do so. Training checkers and materials handlers in the fine points of identification is, in almost all instances, necessary.

Importance of the part number, steel specification grade, color code and other identification means should be made abundantly clear to all concerned. Frequently, checkers are careless for the simple reason that they do not fully comprehend the importance of the work they are doing. Available educational media should be utilized for this task. Plant newspaper, meetings, guided tours through other departments, etc., can instill among receiving personnel an awareness of the important role played by identification.

Standard Checking Procedures—Given free reign, an individual can receive a shipment in any one of many methods, not necessarily the right one. For any given class of material, the most satisfactory receiving procedure should be formulated and, after a suitable trial period, standardized.

These three steps—identification of shipment, facilitation of identification process, and standardization of checking means—are applicable not only to the receiving department but throughout the plant as well. In the storesroom, incoming shipments of materials should be identified by the receiving department by use of small tags, by enclosing like goods in separate containers. In this instance, the steps taken by the vendor in identifying the shipment should be emulated, to a degree, by the receiving department. For example, the receiving slip serves the storesroom in precisely the same manner as the packing slip in the receiving department. Standard practice may make it necessary that all bar stock received into the stores department be checked against the receiving slip, bar

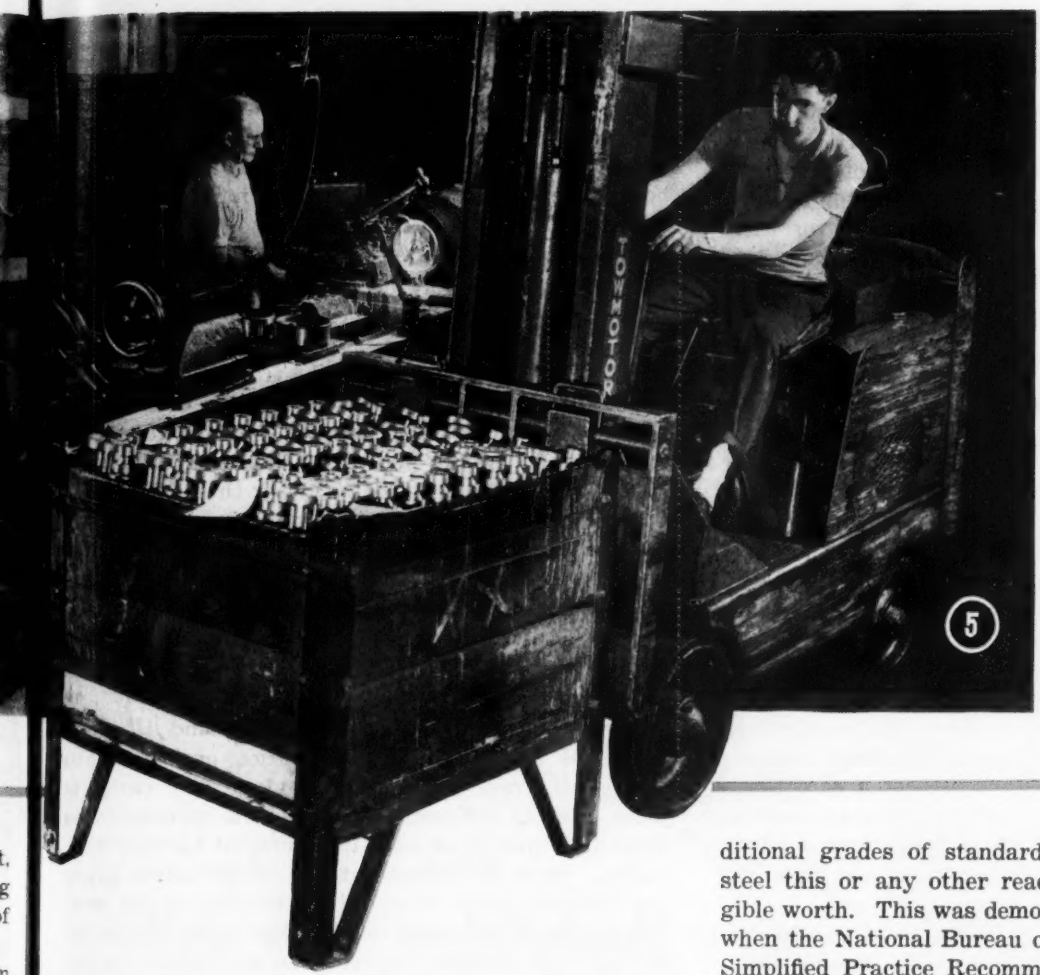


Fig. 4 — Bar stock identified by painting ends with color code, painting size and specification on rack and stamping heat numbers on face of bars. Courtesy Joseph T. Ryerson & Son Inc.

Fig. 5—Identification continues after engineering material has been semifinish machined. In the machine shop, identification is insured by delivering like parts in same skid and identifying lot with tag attached to one of the parts. Courtesy Towmotor Corp.

end painted, lengths impression stamped, individual bars calipered, etc.

The same trinity will apply elsewhere. In the machine shop, shipments of materials from the storeroom are tagged according to job number. Identification is facilitated by the foreman's copy of the material requisition and specified checking procedures are followed before the material is delivered to machine side. It can readily be seen that these three steps can follow the material throughout the entire fabrication cycle.

Incorporated within the framework of a permanent program, the measures mentioned above will constitute a solid foundation for painting, stamping, stenciling, tagging, and other identification means. Broken down by type of material, the identification problem takes on the following appearance:

Bar Stock—The traditional means for indicating chemical composition of ferrous and nonferrous bars is by painting one or both ends in accordance with a predetermined color code. For example, the National Screw Machine Products Association recently adopted the following code for steel bars for the screw machine products industry: B1112—green, B1113—orange, C 1019—yellow, C 1020—white, C 1117—aluminum, C 1118—red, and C 1137—gold.

Plants who handle only these grades of standard AISI-SAE steel might do well to go along with the association and specify that these colors be painted on bar ends by vendors and in their own storesrooms. For the majority of plants who carry in stock additional grades of standard as well as nonstandard steel this or any other ready-made code is of negligible worth. This was demonstrated a few years back when the National Bureau of Standards published its Simplified Practice Recommendation R166-37, "Color Code for Marking Steel Bars." Although it was formulated by a committee on which most major steel suppliers, manufacturers, and users were represented, the standard was pretty much a failure. The reasons are fairly obvious.

Of the 140 SAE chemical composition specifications then in existence, only 89 were to be identified. There just were not enough colors or combinations of colors to fill the bill. Of course, there were available an infinite variety of hues, tones and shades; however, since the purpose of a code was to use only clearly distinguishable colors, colors such as pink, mauve, tangerine, etc., cannot be used. Pink looks like a pale red. Tanegrine might easily be mistaken for red or orange. The code used only single and two-color combinations for the obvious reason that more complex combinations are impractical. Solid colors with stripes, three-color combinations, two-colors plus a dot, etc., are of little value since they are difficult to apply to ends of bars and are, at the very best, far from legible.

The impracticability of a standard code for bar stock is readily apparent for just one example. The Bureau of Standards code specified pink for SAE 3125 and blue-white for SAE 3140. A plant which used the former would probably go along with the code since it is relatively simple to apply a solid color to bar ends. However, if the plant used little or no 3125 and a great amount of 3140, it would not comply with the code. The plant would reason in this fashion: Why waste all this time painting the 3140 with two

colors? Why not paint the 3140 pink and the other grade blue-white? The moment the little bug of logic entered the scene, the color code was doomed.

Today with an even larger number of standard grades of steel and the introduction of H steels, a standard national code is even more out of the question. A standard *company* code is another matter entirely. It is feasible, logical and sensible for each concern to set up its own code for the grades of bar stock which it carries in stock. In formulating such a scheme, pure colors should be assigned to the most popular steels, two-color combinations to the less important varieties, and all other combinations avoided scrupulously. Only pure colors such as red, orange, yellow, green, blue, black, white, aluminum, and gold should be used. From these, 81 color combinations are possible—more than enough for most plants.

Not only should the color be standardized but also the paint brand and manufacturer's color number. Using one grade of paint one day and another the next will result in a lack of uniformity which may be deceiving to materials handlers and others connected with the physical selection of stock. The company standard code should be formulated for nonferrous metals as well. The practice of identifying copper-base alloys by their appearance is not a safe practice, especially when several similar alloys are kept in stock. Considering the high cost of most nonferrous alloys, the few cents for painting bar ends are wisely spent.

A simplified means for applying paint to ends of bars entails bundling the metal lengths so that their faces are even and then spraying the lot. If a second color is required, it can be applied manually over the first coat.

Colors are often applied along the bar length rather than on the ends. At the Glenn L. Martin plant this is done by an automatic system. Bars travel on a conveyor past a stationary spray gun which applies a thin stripe to the bar as it travels by. If two colors are required, an additional gun is stationed alongside the belt. The bar next moves to a stenciling station where a linen stencil, bearing all pertinent information about the stock, is wrapped around the bar and hand sprayed. In this fashion, bars are identified both by color and by the printed information that is on the stencil.

This dual identification is eminently desirable since paint on bar end may become so soiled or smudged as to lose its identity. Once the bar is faced on a lathe, all identification disappears into the chip pan. Should the bar be sawed and the fresh end not be repainted, again identity is lost. For these and other reasons, additional identification is called for. The most widely used is impression stamping with steel dies held in suitable holders. With these, the specification number or identifying symbol is applied along the bar length at stated intervals, usually 2 to 3 feet apart. Automatic rubber stamping device in a carriage which travels the length of the bar is a variation that is widely used. Stenciling, hand painting, decals, labels, and tags are other means used in conjunction with bar stock color codes.

With the advent of hardenability band H steels there has arisen a new identification probelm. For any given grade of H steel, a plant may carry in stock several different batches, each manufactured from a different heat, each in a different hardenability range. Since the three batches of the same grade are different, color alone will be inadequate for positive identification. Several procedures present themselves: (1) Pertinent information is stenciled on the side of the bar. For smaller diameters, individual metal lengths are bundled together and a tag, bearing pertinent data, attached securely. (2) Heat number is stamped on face of bars or toward that end of the bar which extends from the rack. (3) Purchase order number is indicated on bar. Reference to copy of purchase order will establish exact identity. (4) Bars

60,300,000 GLASSES OF BEER: That amount of the amber beverage is contained in the approximately 170 glass-lined tanks shown above. The thin layer of glass, literally fused to tanks' inner steel surface, protects the steel from the corrosive effects of acid and prevents contents from picking up impurities. Tanks were manufactured by Vessel Division of A. O. Smith Corp., Milwaukee, Wis.

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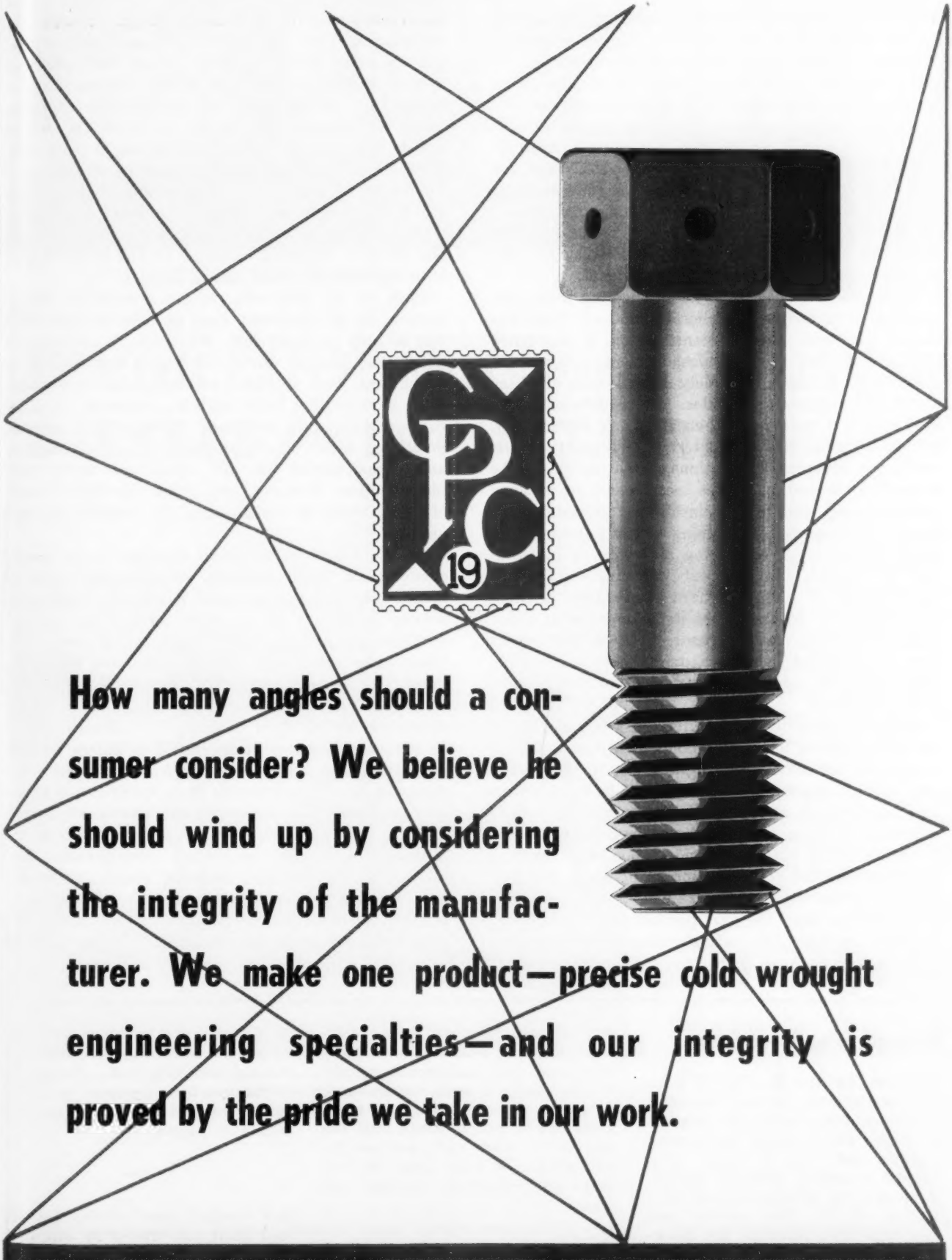

How many angles should a consumer consider? We believe he should wind up by considering the integrity of the manufacturer. We make one product—precise cold wrought engineering specialties—and our integrity is proved by the pride we take in our work.

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are segregated in separate racks according to hardenability rating. This last method, although somewhat wasteful of rack space, has much to recommend it. As a shipment of H steel is received, it is suitably identified and then placed in a separate section. Information on the shipment, plus other data can be attached to the rack or enclosed in a plastic envelope. This method can be applied for all bar stock and, for that matter, for all such engineering materials as castings, forgings and others.

Color codes and other identification methods for bar stock can also be applied to forgings which are frequently made from identical types of metal.

Tubes And Pipes—For these engineering materials, chemical composition is generally not an important factor. Instead, correct identification is concerned chiefly with size. Correct measurement of the inside diameter of tubing is extremely difficult with ordinary storeroom calipers and scales. Since different sizes may vary less than a few thousandths of an inch, and the difference in size may determine suitability of the metal for different applications, attention should be directed at indicating on the metal itself, or in some other fashion, the precise inside and outside diameters. One means for so doing is the following: A small slip of paper containing all pertinent information is inserted into the tube opening. Slips are quickly run off on a standard duplicating machine and distributed to the stores department with paper work concerning the shipment. Pigeon hole racks with size painted over each cubby hole is a widely used means for insuring correct identification of both tubes and pipes.

Castings—Despite the manifest ease of incorporating part numbers in casting molds, many parts do not receive the benefit of this simple precautionary measure. Where casting the part number is not feasible, this information should be impressioned or rubber stamped. Adding the chemical composition number in plants where both alloy and carbon steel castings are used facilitates segregation of scrap in the machine shop and entails no extra work. A simple symbol, before or after the part number, is all that is required to establish the casting's chemical composition.

Until now we have been concerned with identification via the material itself; in one way or another the appearance of the metal is changed so that identification is made more apparent. Even more effective, because it strikes at the root of the problem, is standardization. The problem of identification increases as do the number and variety of materials. Where dozens of bar stock types all are carried in stock, hundreds of steel stamps, many cans of paint, and much time must be expended in maintaining identity. This job declines with the number of metal types. From a purely economic point of view, it is cheaper to store one lot of a thousand castings, all the same, than it is to store ten different lots of 50 each.

Each of the fifty will require a separate storage section. In all likelihood, most of these storage areas will be only partially full. When all the castings are alike, they can be stored far more economically in fewer bins, each of which will be loaded to capacity. Each part number bears with it a separate set of records and separate inventory entries and, in general, much red tape. The arguments for standardization and simplification are not concerned solely with identification; however, even from this limited point of view, there is justification for considering such action.

At the height of the steel shortage, many plants accumulated large numbers of alternate types of metal. The purchasing agent might have purchased several grades to fill an order for a steel type not available at the time. Over a number of years large numbers of steel types have accumulated which are entirely expendable and which can, with no great loss, be disposed of. Procurement policies, not only for bar stock but for all other engineering materials, should be reviewed. Stricter limits should be imposed on the number of acceptable substitutes and engineers and designers should re-examine their specification sheets to determine where special metals can be eliminated. Obsolete stock, which merely occupies space in the storage racks and constitutes considerable dead weight on the company records, should be weeded out. Frequently, such materials can be eliminated by a conscious program whereby they are utilized on current jobs. Materials which cannot be used should be scrapped or in some other manner eliminated.

Magnetic Dies Speed Setups

DIE sets for the piercing of holes in materials up to and including ⅛-inch mild sheet steel may be made up faster with magnetic perforating punches and dies assembled in a templet mounting plate, a development of S. B. Whistler & Sons Inc., Buffalo, N. Y. The punches and dies, with their retainers, are quickly removable and ready for use in a new arrangement upon completion of any job. Only the two templets are stored, these being the only parts necessary to duplicate the original job at any time.

The company maintains a stock of standard sizes of punches, dies, bushings, retainers, etc., for perforating round, oval, square or rectangular holes from 1/32 to 3-inch diameters. Special shapes or sizes may be made to order. It is reported that tolerances can be held to 0.0005-inch. Die sets can be made up to any size for any number of holes using the new magnetic perforating punches and dies.

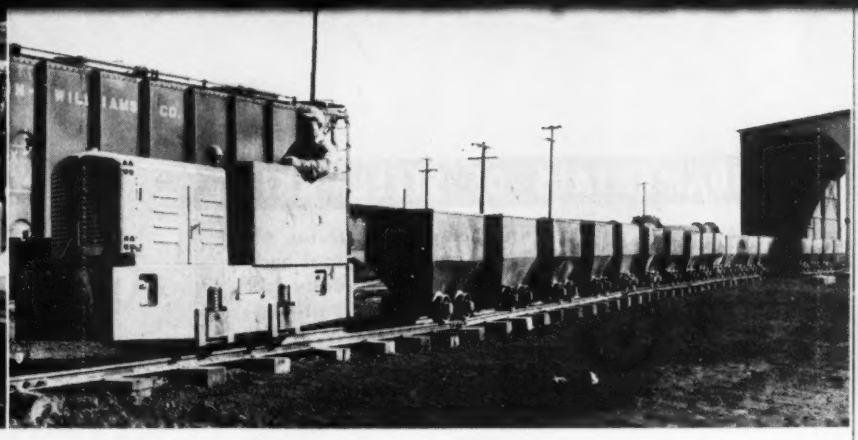
Powder Metallurgy Symposium

OUTGROWTH of research programs concerned with solid-state reactions such as self-diffusion phenomena, recrystallization and grain growth at the metallurgical laboratories of Sylvania Electric Products Inc., Bayside, N. Y., was a symposium on the theory of powder metallurgy and physics of metals, held last week. Papers and discussions by a group of specialists were presented in six sessions, each with four papers.

—o—

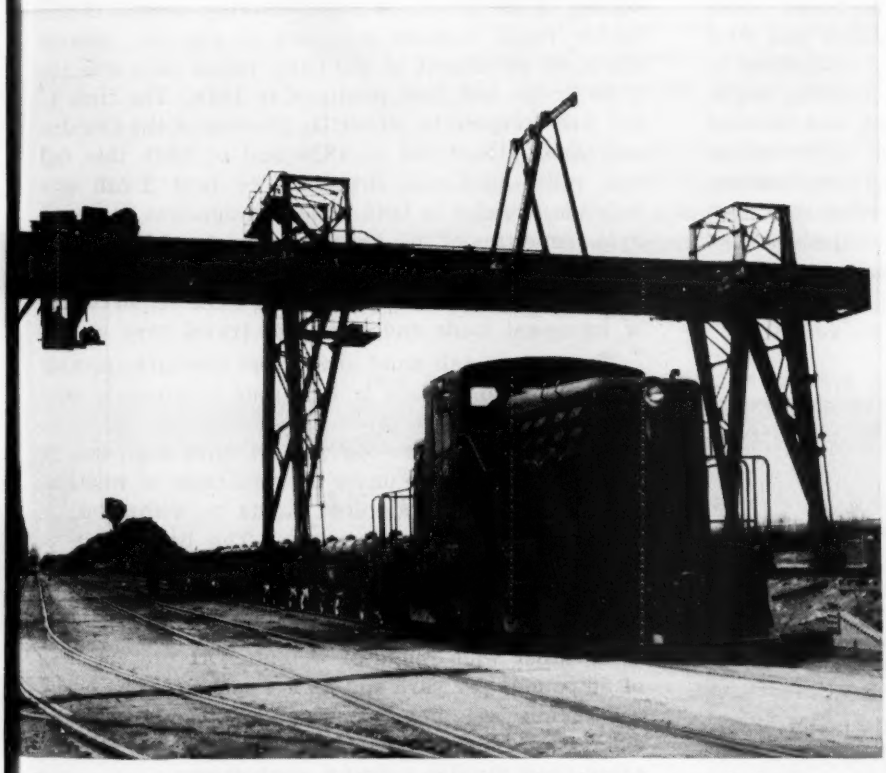
AN integral part of the package unit shaft seal offered by Gits Bros. Mfg. Co., Chicago, is a Graphitar sealing ring which embodies both rotating and stationary sealing surfaces. Developed by United States Graphite Co., Saginaw, Mich., the new material is inert and is unaffected by heat, cold or chemicals of any kind.

At eastern copper plant an 8-ton Diesel engine picks up loaded car for delivery to warehouse.



Whitcomb 4-ton Industrial Locomotive hauls metallic concentrates from loading dock at Ozark Smelting & Mining Company, Coffeyville, Kansas.

IMPORTANT COMPANIES PICK WHITCOMB DIESELS FOR IMPORTANT PRODUCTION JOBS



Whitcomb 65-ton Industrial Diesel switching a string of open-hearth charging cars at a large, midwestern steel plant. Whitcomb Diesel Electric Locomotives are widely used in steel production.

Throughout industry, where you find carefully engineered, fast-paced handling of materials and freight you're likely to find Whitcomb Industrial Diesels turning in a record-breaking performance. For Whitcomb Diesels provide the stamina, the high availability, the power, the speed, the economy needed for modern, mechanized handling of freight and materials.

Each Whitcomb Diesel Locomotive is custom engineered to become an integrated, coordinated part of a planned materials handling program. That's why you'll find them in leading industrial plants throughout the country. Whitcomb Industrial Diesel Locomotives are key performers in mass production.

Write today for illustrated literature on Whitcomb Locomotives — Diesel mechanicals from 3 to 30 tons; Diesel electrics from 25 to 95 tons.

-ton Whitcomb Diesel Electric hauls cars of pine wood from the railroad spur to the Hercules Powder Company's operations at Brunswick, Georgia. Economy, speed and high availability make the unit ideal for the job.

There's no power more economical than Diesel; no locomotive finer than a Whitcomb.

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NUMBER **11** OF SERIES

Another in a continuing series of articles on the making of steel and finishing it into products ready for the consumer. Each article is written by an outstanding authority in his particular field.

By FREDERICK M. GILLIES
Works Manager
and
WILBUR E. DITTRICH
Superintendent, Blooming, Structural and Rail Mills
Inland Steel Co.
Chicago

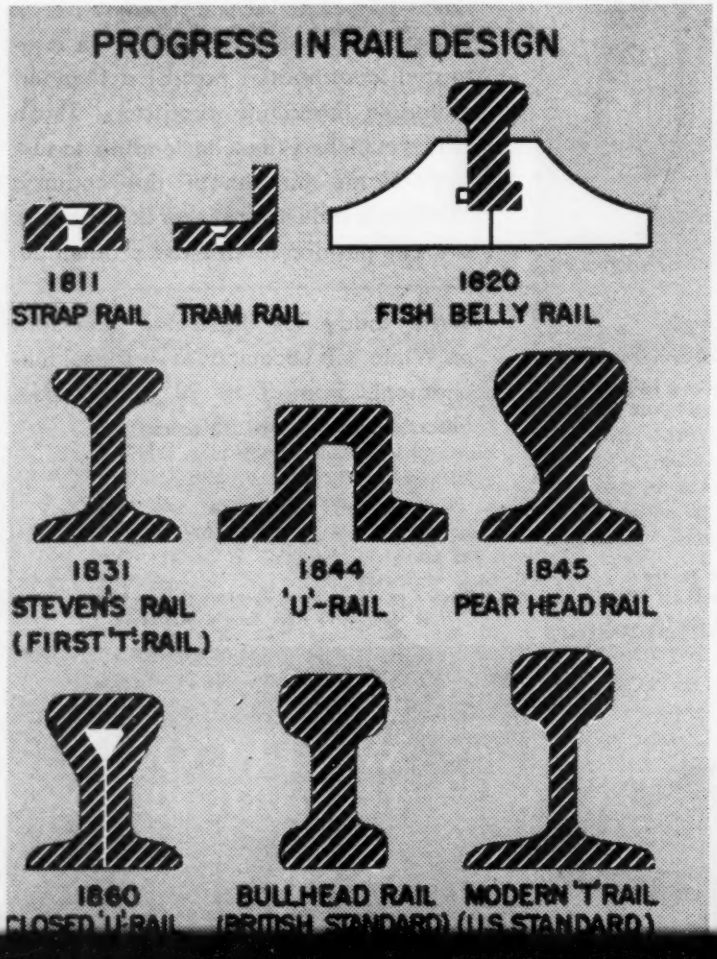
Production of Structural Shapes *and Rails*

The authors trace the history of railroad rails and their methods of production from 1830 to date. Branding, end-hardening and testing of the product are discussed in the following article

PART II

RAPID advancement of rail transportation from about 1830 on was a challenge to the iron and steel industry in providing rails and related equipment to keep pace with demands. Locomotive building began in United States about the same period, and railroad rails became a prime concern of the early rolling mills. First rolled rails were flat section bars fastened to wooden sleepers. Prior to this, various cast iron sections were used. However rolled shaped-sections were soon devised to improve the qualities and economies of the track. A chart showing several of the earlier rolled sections is shown in Fig. 12. Among the more prominent of the early rolled rails was the U or bridge rail first produced in 1844. The first T-rail was designed by Robert L. Stevens of the Camden and Amboy Railroad in 1830 and in 1831 this rail was rolled in Great Britain. The first T-rail was rolled in America in 1845. The T-design was improved by a committee of the American Society of Civil Engineers in 1893 and this general form is now known as the American T-rail. It has met the requirements of increased loads and speeds of travel very well.

Fig. 12—Chart of several of the earlier rolled-rail sections



The modern rail must have great strength, provide adequate head surface and contour to properly support the load and provide wear resistance and sufficient metal for wear. Rails must have high impact and shock resistance under all conditions of weather, and possess high endurance limits to withstand repeated stresses and vibrations. The base must be sufficiently wide to provide firm and ample bearing on the plates and ties to properly support and distribute the load. Various sections of T-rails are rolled in a rather wide range of weights. At present rails of 80 pounds per yard and up are considered as heavy rails; rails weighing less than 80 pounds are considered as light rails and are currently used in services other than strictly railroad applications.

Metallurgical advancements afforded by the advent of the bessemer process in 1856, and the basic open hearth process in 1888, were of tremendous influence toward expanding the productivity of the iron and steel industry both quantity and quality wise. There can be little doubt that these developments were perhaps the greatest single influence in the rapid development of the United States. The first bessemer-steel rails produced in United States were made at the North Chicago rolling mills in 1865. Bessemer rails continued to be produced in large quantities until about 1910 when basic open-hearth rails began to appear. Virtually all rails are now made from open-hearth steel.

Early rolling mills were two-high, so called "pull-

...that wearing out an old machine is expensive

Of course, you know that an obsolete machine, even with its low carrying charges, usually costs more to run than a new one. Your treasurer probably knows that, too; but it won't hurt to remind him that the best time to replace old machines is before they are completely amortized on the books. For, an automatic five years old is dangerously below today's Acme-Gridley production standards.

If you have seen new Acme-Gridley Automatics in action, you know that doubled production is not uncommon. Maybe we could help you prove this point for your treasurer—by placing in your hands more case histories of the actual experiences of some of our customers—down-to-earth records of dollars saved with new Acme-Gridley Automatics. Here's a typical example:

CUT THIS OUT FOR USE WHEN YOUR TREASURER WANTS PROOF

AN ACME-GRIDLEY CERTIFIED CASE STUDY

THIS IS WHAT HAPPENED

MACHINE—2" RB-6 Spindle Acme-Gridley Automatic

PART TURNED—Steel Eccentric Bushing

MACHINING TIME—17½ seconds—for 15 operations

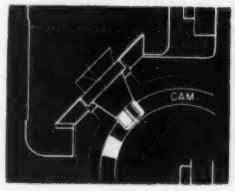
FORMER METHOD—Blank out on automatic, then on second machine, finish eccentric shoulders, internal recess and gouge O.D.

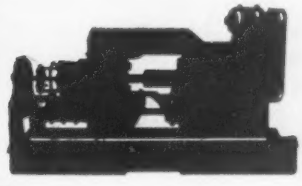
PRODUCTION INCREASE—300%

AND HERE'S ONE IMPORTANT REASON

THE ACME-GRIDLEY CROSS SLIDE is rigidly supported, low in the frame, without overhang, and has easily adjustable gibs on hardened steel ways. This design provides direct contact between the drum cam and roll, and at the center of the slide. Positive cam control is insured and excessive linkage is avoided. Moreover, there are fewer parts to wear.

Generous open space around the slides gives more chip clearance, and more efficient operating convenience, through greater accessibility to tools—all factors that insure accuracy, increased production and lower costs.





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ACME-GRIDLEY BAR and CHUCKING AUTOMATICS built in 4, 6 and 8 spindle styles, maintain accuracy at the highest spindle speeds and fastest feeds modern cutting tools can withstand.

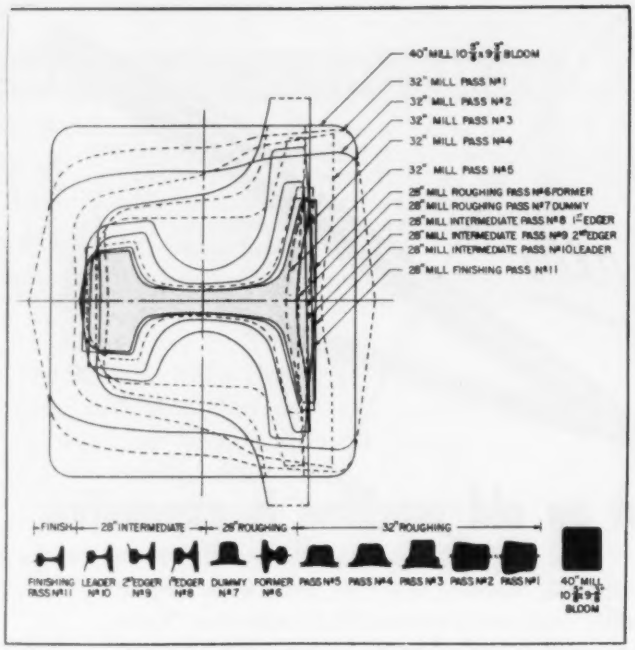

Fig. 13—Roll pass development for production of 133-pound rails

over" mills in various combinations. After a pass was made the bar was pulled back over the top roll before being entered into a succeeding pass. The limitation of such rolling is obvious.

The first major improvement came in 1857 with the introduction of the three-high mill devised by John Fritz of the Cambria Iron Co. This eliminated the idle passes of the two-high mill and with the use of lifting devices to raise the bar to the top pass level, it was possible to process greater weights and lengths. When cast-steel ingots of steadily increasing weights became available, mills were devised to accommodate them. Early bessemer ingots weighed 500 to 600 pounds and were approximately 9 inches square at the top, 11 inches square at the bottom, and about 21 inches long. Mill facilities were designed to process progressively heavier and longer rails. The demand for rails was so great that a large number of comparatively small rolling mills could not supply the need. Sixty-nine mills were producing rails in 1874; however, at present 11 mills are producing standard rails in the United States.

Some rail mills are used entirely for rail rolling whereas others produce structural and other shapes as well as rails. Producers with large facilities and sufficient order volume have mills especially devised for rail rolling. Specialty mills have production advantages over the combination mills used by smaller producers but are lacking in flexibility. Most mills roll rails from reheated blooms. They are, however, also rolled direct from the ingot without reheating. Arrangements differ in many other respects. Some

CHEMICAL REQUIREMENTS FOR RAILROAD RAILS

	Weight in Pounds per Yard			
	70–84	85–100	101–120	121–140
Carbon	0.53–0.70	0.64–0.77	0.67–0.80	0.69–0.82
Manganese	0.60–0.90	0.60–0.90	0.70–1.00	0.70–1.00
Phosphorous (Not to exceed)	0.04	0.04	0.04	0.04
Silicon	0.10–0.23	0.10–0.23	0.10–0.23	0.10–0.23

Structural Shapes

mills have more stands than others, some are two-high, others three-high. Rail blooming mills differ in size and arrangement but are usually two-high reversing units which may be designed for bloom rolling exclusively or to roll slabs and billets as well. The general manner of processing cast ingots into rails is much the same in all mills in that the rail is developed from a bloom in the rail mill. While number of passes used in the finishing mills may vary, the general pattern of reduction is essentially the same in most mills. A typical pass schedule for producing a rail from the bloom and the manner in which the passes are cut into the rolls is shown in Fig. 13. Roll diameters of rail finishing mills are usually about 28 inches. This comparatively large diameter is necessary to provide sufficient roll strength at the flange recesses in the rolls. Hard tough rolls, particularly in the final passes, are necessary to avoid excessive wearing of the passes and consequent deviation from accurate section and roughness of surface. From Fig. 13 it will be seen that the shape development begins at once in the breakdown mill with the formation of the flanges being the first concern. In the 28-inch mill the second roughing pass, called the dummy pass, is devoted entirely to spreading out and developing the flanges. In following passes the flanges are reduced and controlled in successive open and closed flange recesses, while the head and web are also progressively reduced. The finishing mill passes are commonly called former, dummy, first edger, second edger, leader and finishing. A drawing of finishing rolls for rails is shown in Fig. 14.

Proper guide equipment must be used to enter and deliver the bars from the roll passes. Side guides equipped with rollers are often used, particularly in final passes to avoid marring the surface. Proper guide setting is extremely important since the guides must accomplish their purpose without damaging the bar. Finishing pass guides must be properly set to deliver the rail straight. Hooks or twists cannot be tolerated. Since rails are rolled to very close tolerance, the roller must exercise care in the setting of passes.

A typical rail mill which is also used to produce structural as well as other shapes was shown in Fig. 3. This mill has been described in the discussion of

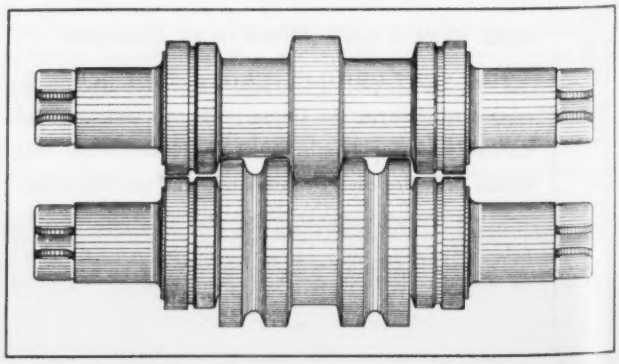

Fig. 14—Sketch of a pair of rail finishing rolls

54 EVERDUR WELDS for extra strength and rigidity . . .

TOTAL WELDING TIME: FIVE MINUTES

Electrically spot-welded Harrison Steel Kitchen Cabinets being carbon arc welded with Everdur rod. Circles on finished cabinets, below, indicate 54 points where members are reinforced.

THIS is the way Vincent Russo, Superintendent of the Harrison Steel Cabinet Company of Chicago, tells the story:

"Although our steel cabinets are electrically spot-welded throughout, we have found that carbon arc welding the corners and joints with Everdur* rods assures the additional strength and rigidity a quality item deserves.

"Years ago we found that by bronze-welding our drawer guides in the cabinets, rather than screwing them in place, not only was added rigidity obtained, but we eliminated the possibility of drawers getting out of line because of loosened screws.

"In our average-size sink and wall cabinets there are a total of 54 carbon arc welds made with Everdur rod. While this seems excessive, our actual welding time is less than five minutes, due principally to the low melting point of this copper-silicon alloy rod. The additional cost of this welding is far overshadowed by the extra strength and added quality."

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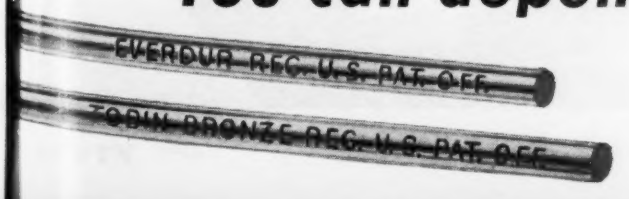


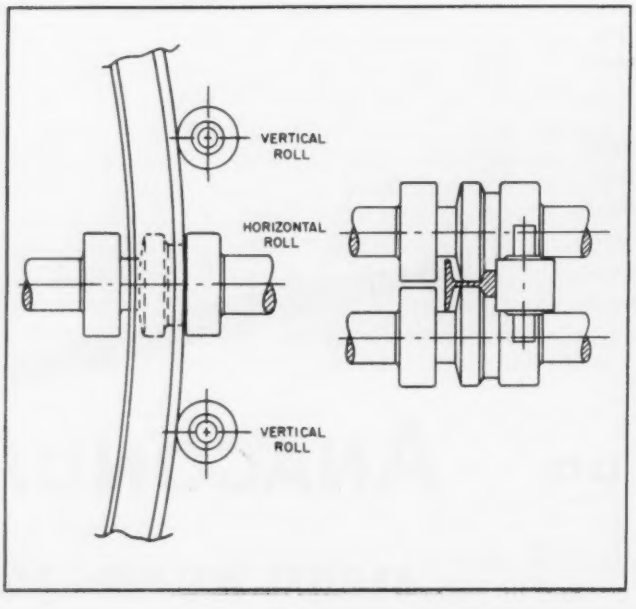
ANACONDA

BRONZE WELDING RODS

Fig. 15—Rail drop saws cutting the finished rolled product into standard 39-foot lengths

structural mills. The manner in which rails are rolled in this mill is presented at this point. A 27⅜-inch square ingot weighing approximately 16,000 pounds is rolled in a 40-inch blooming mill to the required bloom size ranging from 9 x 8 inches to 11 x 9 inches and then passed on to an electrically driven shear for cropping and shearing. Blooms pass directly down a table line to continuous reheating furnaces where they are reheated for rolling into rails. On discharge from the reheating furnaces, blooms are given five passes in a 32-inch two-high reversing breakdown mill, then pass on directly to the three-high roughing stand of the 28-inch mill. The bar receives two passes in the roughing stand, is transferred to the three-high intermediate stand where it is given three passes, and then transferred to the finishing stand

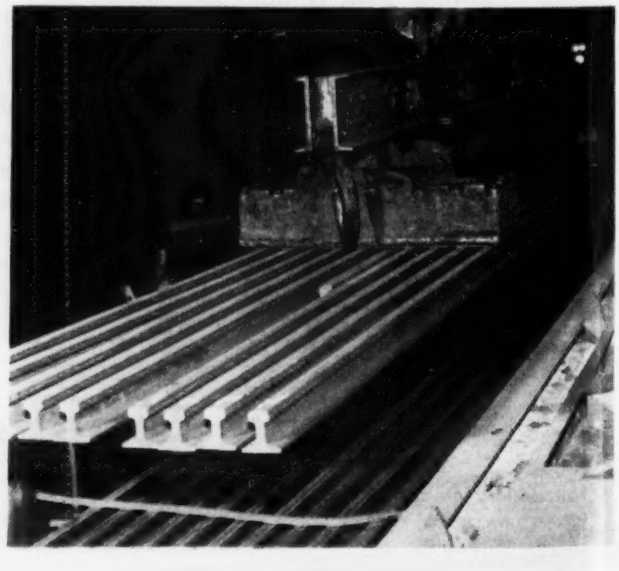
Fig. 16—Top and side views of rail cambering machine for straightening the product



for the final pass. The rail is rolled from the bloom in 11 passes. Steam and water are used at strategic passes in the mills to clean scale from the bar to ensure a smooth finished surface. Two bars may be worked in the mill simultaneously, 50 to 60 blooms or approximately 100 tons per hour are possible. On leaving the finishing pass the rail is carried on the collared and recessed section of a runout table to the drop saws, Fig. 15, for cutting into standard rail lengths of 39 feet. Rail saw-blades are approximately 56 inches in diameter and about ⅜-inch thick having ground teeth in the cutting edge. The saw rotates at a peripheral speed of approximately 20,000 feet per minute. Saws must cut true, and not run-off or the end will be off-square. Sufficient allowance must be made as the rail will shrink about 3/16-inch per foot of length. The rail is supported under the saw by a special casting called a saw block. Improperly supported, the rail will become kinked in the sawing operation. Extreme care throughout rolling is necessary to prevent mechanical defects marring the surface such as scratches, gouges, tears, and related defects. Section requirements on rails are exacting. Section templates are provided to check and measure the section. Important section features are proper head contour and width. Proper base width is essential to fit the rail base of the tie plate. Finishing fit is important to provide proper fit and bearing of the joint bars. The base must be flat. The section weight is also important and must be held to within one-half of 1 per cent of the nominal weight. These section features are continually checked throughout the rolling

After sawing, the rails pass through a machine, Fig. 16, which cambers, or curves, the rail toward the base with the head on the outside or long side of the curve. Purpose of this is to equalize the effects of contraction in cooling. With the thinner members of the section cooling faster and the greater head mass at a higher temperature, head contraction would normally be greater than the base. By cambering the

Fig. 17—Lift of rails being removed from a control cooling box by magnet crane



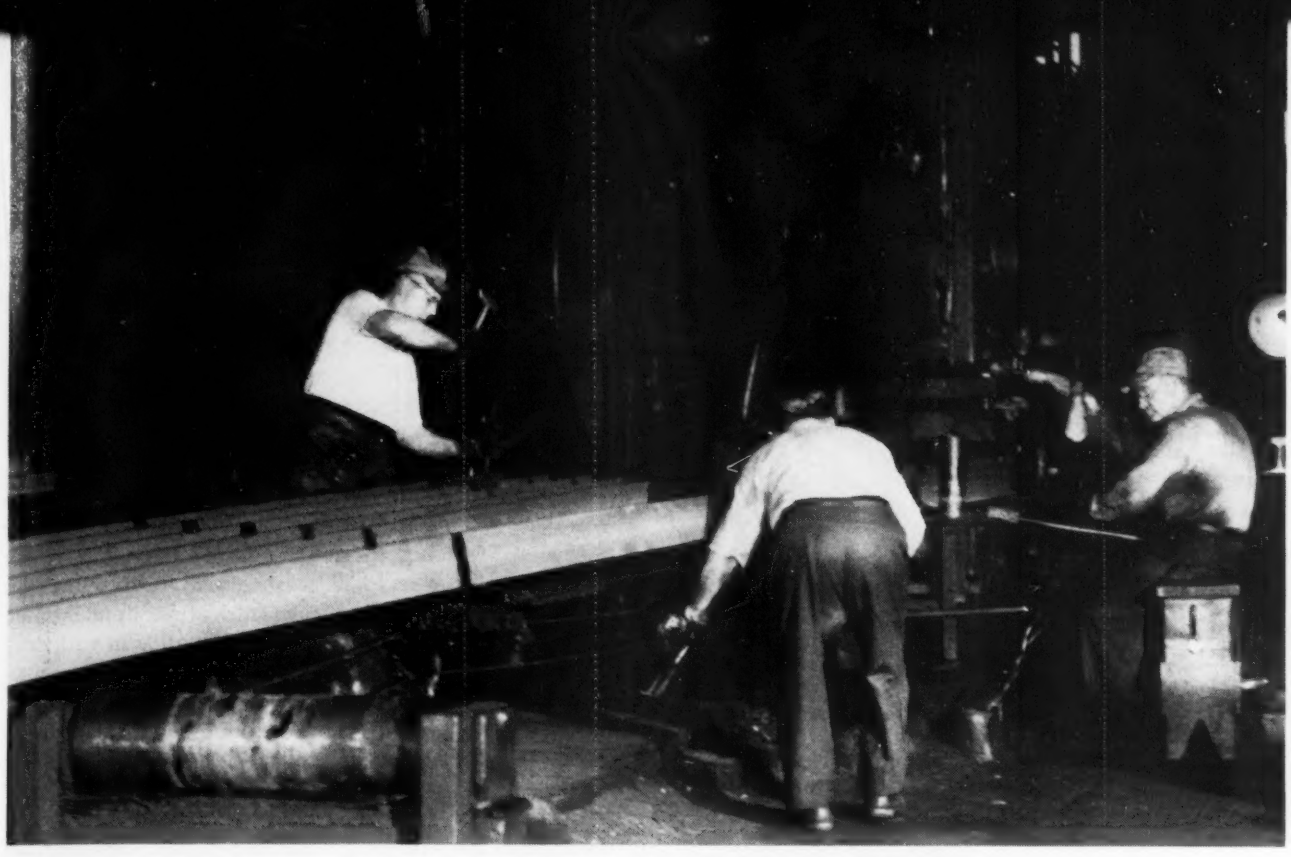


Fig. 18—Cold straightening operation being performed on a rail

Structural Shapes

rail, this effect is counteracted and the rail becomes virtually straight when cold. Careful cambering is necessary to minimize cold straightening.

Certain identifying information is placed on each rail. A portion of this is rolled on in the finishing pass and is called the brand. Brand characters are raised and are formed by steel filling the marking which has been cut or engraved in the bottom finishing roll. The brand is placed on the web of the rail and includes the following information: Weight and section number of rail, type of design, kind of steel, manufacturer and mill, year and month rolled.

Other information is hot stamped on the top side of the web and includes the following: Heat number, ingot number, position letter of rail in ingot, and finishing treatment.

After the rails are cut to length and cambered, they are pulled off onto the hot bed where they are evenly spaced to permit uniform cooling. Formerly rails were allowed to cool on the beds and then sent to the finishing department. It has been found that by retarding the cooling between 1000 and 300 degrees F, minute internal flaws are prevented. Service failure known as transverse fissures are believed to arise from internal flaws resulting from too fast cooling. Procedure is to remove the rails in lifts of about ten from the hot bed at about 1000 degrees F and place them in insulated boxes where they are allowed to cool slowly to below 300 degrees F before they are removed. Rails must stay in the boxes for about 15 hours before they may be removed. Fig 17 shows the crane removing a lift of rails from the cooling box.

It is imperative that rails be straight and true to provide a good track. Rails are final straightened by the use of gag presses. The rail is moved under the press by the rail straightener who determines points of deviation from line by sighting along the rail and directs the gagger to place the gag between the rail and the oscillating head of the machine. The rail is then deflected at the proper point and degree to bring it into alignment. Blows may be made with the head up, base up, or side up as required. The rail may be rotated in 90 degree turns by the straightener. The straightening operation and rail-turning device are shown in Figs. 18 and 19.

After straightening the rails are drilled with bolt holes for fastening the joint bar. Two or three hole drilling is used and the holes are spaced according to individual customer requirements. Saw burrs are chipped off and the sharp edges relieved by grinding. After drilling the rails are placed on inspection beds in an unroofed building to permit daylight inspection. Final inspection for surface defects, section, end squareness and soundness is conducted at this point,

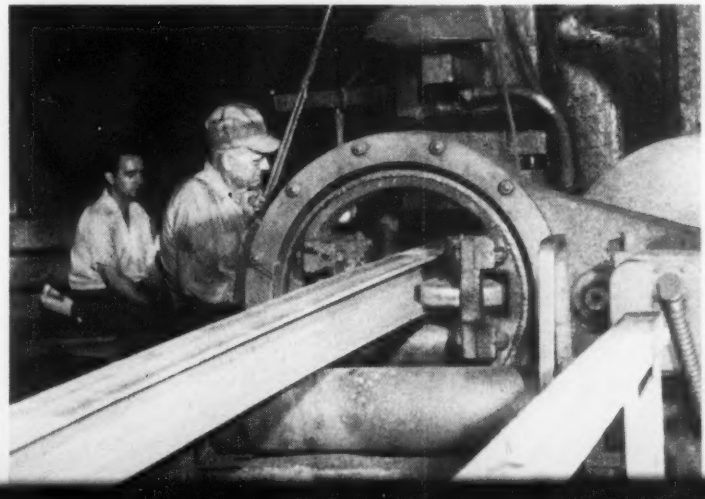


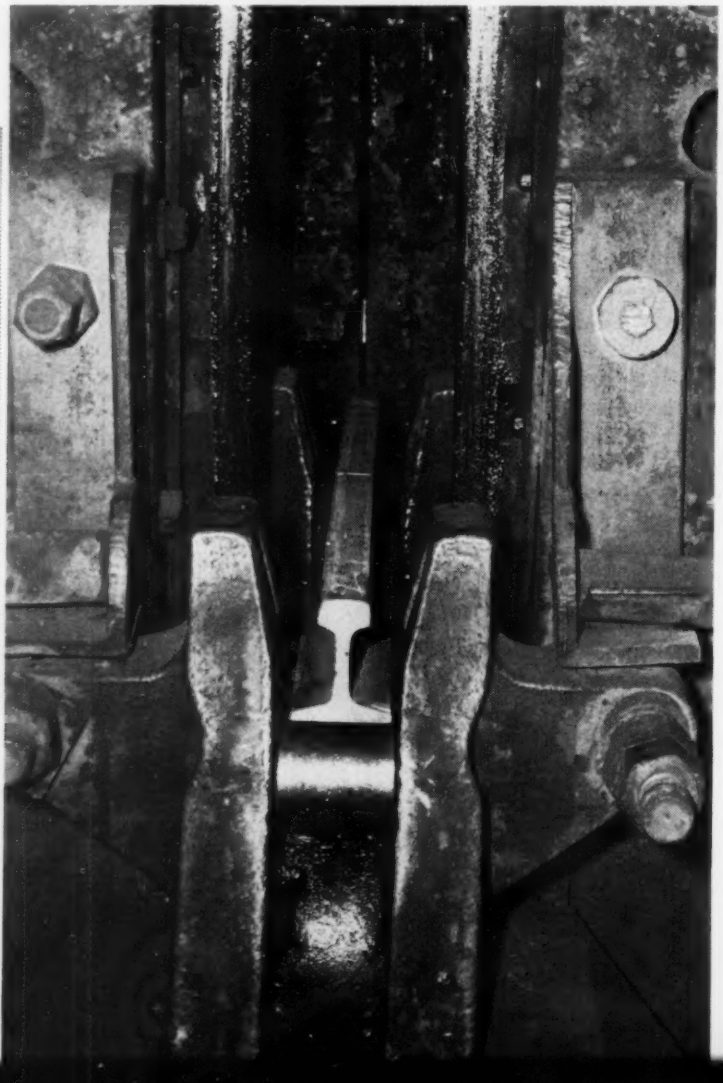
Fig. 19—Rail turning device which is a part of the straightening press

Fig. 20—Inspectors performing the final visual inspection of the finished rail

see Fig. 20. Light surface flaws are cause for classification as second quality rails. Heavy surface defects are cause for rejection. Ends are painted in color to denote classification as follows: Cuts, green; A-rails or top rail cut from topmost position in the ingot, yellow; second quality, white; X-rails, brown, and high carbon, blue.

Heat treatment of rail ends is becoming widely used. The purpose is to increase the hardness of the head surface at the end of the rail and thereby reduce rail-end batter which results from the impact of train wheels on the rail-end at the joint. Smoother track and longer rail life are obtained. After the rails have been final straightened and drilled they are placed head up on beds. Special heaters fired with coke oven gas and compressed air are clamped to the rail-end. The head of the rail is heated to approximately 1550 degrees F and the heater is then removed and replaced by a cooler wherein a stream of air is directed on the rail head to accomplish the desired hardening. Hardness is ordinarily increased from 260 to 340 Brinell at the extreme rail-end.

Fig. 21—Drop test specimen in place for testing



Modern refining methods and controls have permitted steelmakers to direct heats to rail application or to divert unsuitable heats into other applications. Rail makers set high standards of quality in rail steel refining and rolling. Purchasers or their representative inspectors have access to the steel works to observe processing at all stages and to reject, protest or accept the rails being rolled. No other commodity is subjected to such scrutiny. Finished rails are subject to the so called "nick and break" test which has been introduced to further check the interior soundness of finished rails. An 18-inch test piece is cut from the top of the first rail of the ingot from each ingot of any heat which has been applied. These pieces are nicked and broken and the fractures examined; any interior defects such as pipe segregation, unusual structure, or foreign matter cause the top rails to be classed as X-rails or to be rejected. X-rails are placed in limited service by the railroads. Impact resistance and ductility is measured by the drop test. In this test a 2000-pound tup is dropped from heights ranging 16 to 22 feet depending on the weight of the section. The piece being tested is 4 to 6 feet long, placed head up across supports placed 3 feet apart for specimens 106 pounds and lighter and 4 feet apart for all heavier rails. Fig. 21 shows a drop test specimen in place in the testing machine. Test specimens are cut from the second middle and last rollable ingots of all rail heats. If any test piece fails to withstand one blow of the tup, all of the A or top rails of the heat are rejected. The heat is then retested using test specimens representing the B rails. If the retest is satisfactory, the remaining portion of the heat is accepted. Rejections due to drop test failure are rare since the control which has been exercised in maintaining quality has been directed toward this end. American Railway Engineering Association chemical requirements are shown in accompanying table.

Rail producers as well as railway engineers continue research to improve the quality and design of rails and rail fastenings. Sections of experimental track are studied and observed under various service conditions to further and improve safety and economy of transportation.

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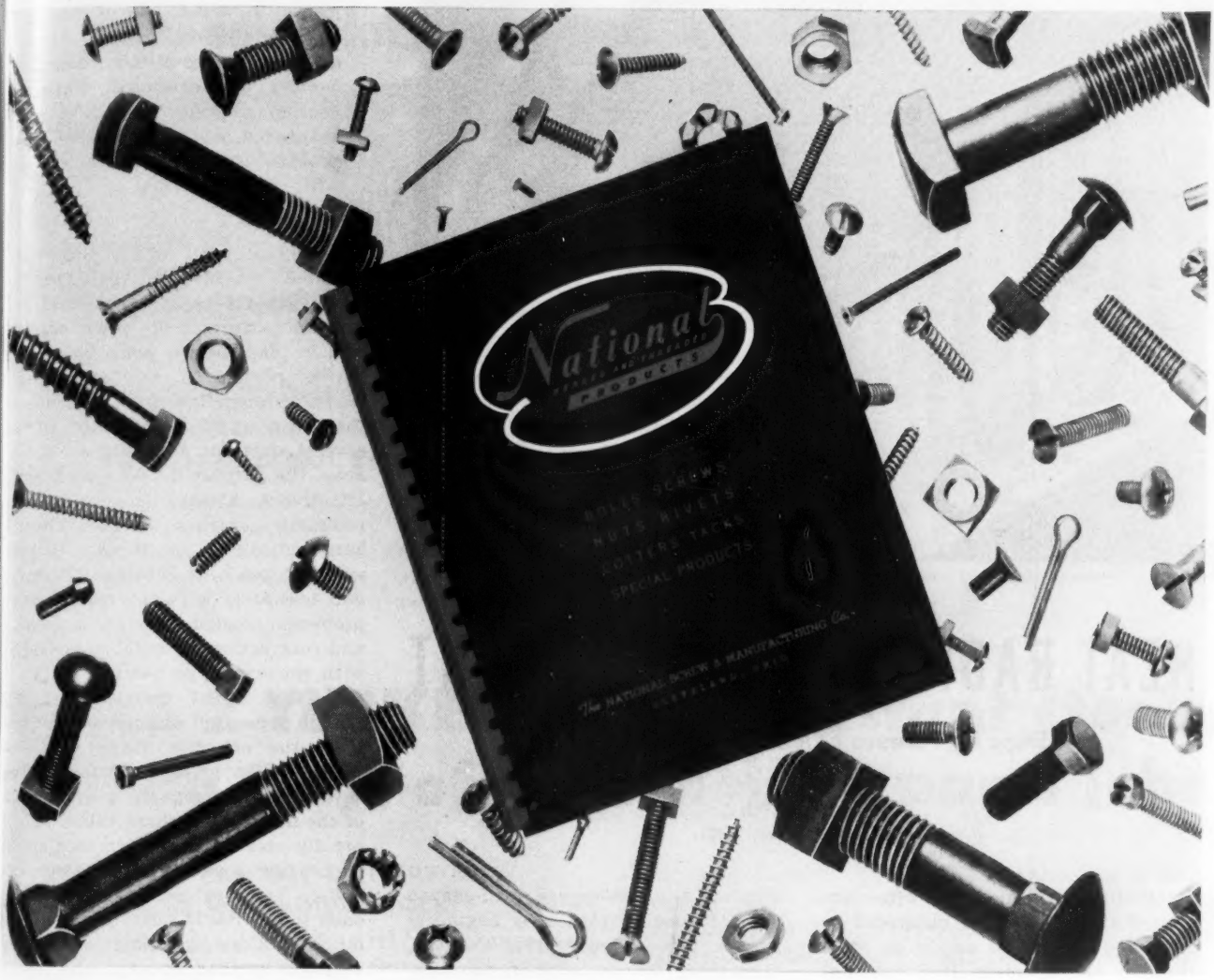

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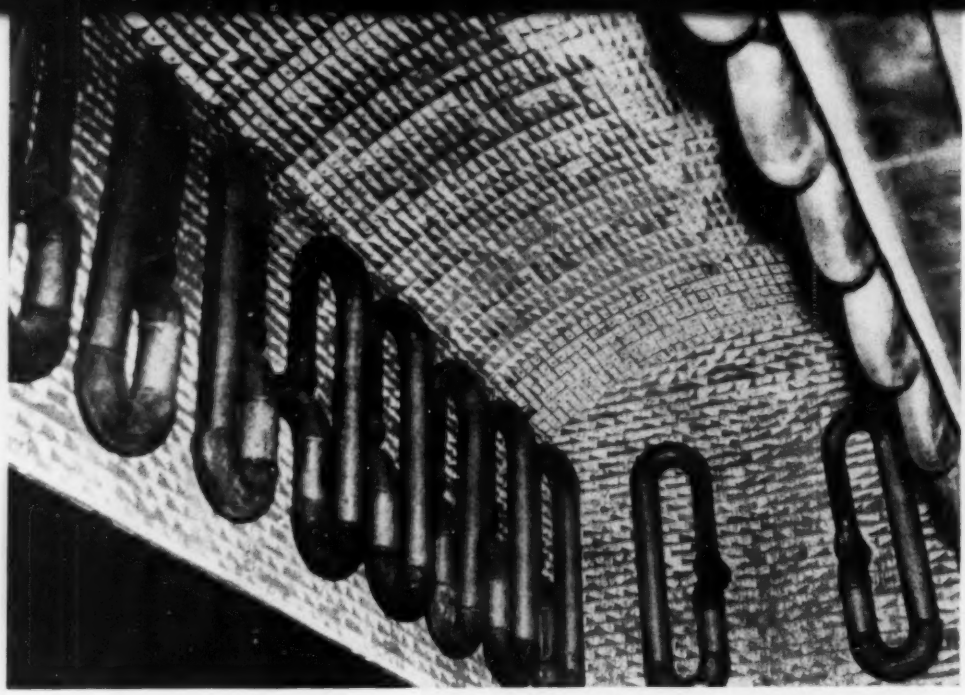

Fig. 1—Interior view of malleablizing furnace showing how newly-developed O-tube radiant heaters are arranged. Entire heating area of each tube is suspended inside the furnace to provide 100 per cent heating efficiency

HEAT RADIATION DEVELOPMENT

Steps Up Furnace Efficiency, Cuts Fuel Costs

By JAY DeEULIS
Engineering Editor, STEEL

PRODUCTION leaks very often are caused through use of outmoded or worn equipment, but almost as often through use of production aids not just quite right in efficiency for the specific purpose. Performance-wise many production aids may do the job ably, but other factors such as upkeep or fuel consumption may not be too conducive to lower operating costs.

One Michigan company found the latter condition in its malleablizing operations in studying fuel costs recently, and corrected the situation by taking advantage of one of the latest developments in heat radiation—a new 180-degree oval-shaped radiant tube developed by engineers of Lee Wilson Engineering Co. Inc, Cleveland. The installation, the company discovered, not only resulted in fuel savings of some 18 to 25 per cent, but increased furnace production by about the same amount as well.

Handles All Size Castings—Interior view of the furnace, which the company employs to process both large and small castings, Fig. 1, shows how these radiant heating tubes are employed to provide the required amount of heat for malleabilizing operations.

Simplicity with which tubes are mounted—eliminating the use of alloy supports—adds considerably to furnace performance. Each tube is held in place at the point where the burner portion of the heater protrudes through the brick sidewall of the furnace, a factor that offers several apparent advantages. It enables the furnace to be sealed more effectively, allows the entire heat radiating portions of the tube to hang entirely in the furnace to provide 100 per cent heating efficiency, and does away with any maintenance problems created through expansion and contraction of metal experienced with previous type heating units.

Heating Speed Increased — Although some fuel savings are derived from the effective furnace-wall-to-tube seals, a greater portion of the savings comes from the performance of the individual radiant tubes. They are due chiefly to the increased speed of heating together with lower exhaust temperatures provided by each tube. Rapid heating rate is induced by a cracking flame created by a simple method of combining some secondary air with small amounts of primary air and gas in the burner, Fig. 2. A glance at the drawing, Fig. 2, indicates how the cracking flame is made to increase the speed of the luminous flame which travels first downward then up and around the 180-degree tube to exhaust either into the air or into a collector manifold.

Economic Performance—Flexibility of heating is another interesting feature of the O-tube, as it is called.

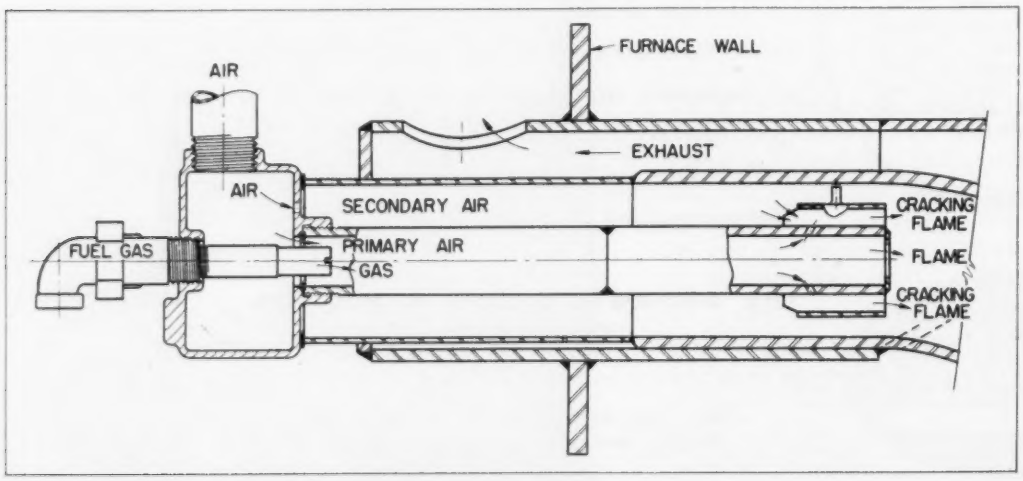

Fig. 2—Drawing indicating how air and fuel are combined in burner, and how they are broken down to provide a cracking flame which accelerates luminous flame to increase rate of heating. Exhaust area also is shown

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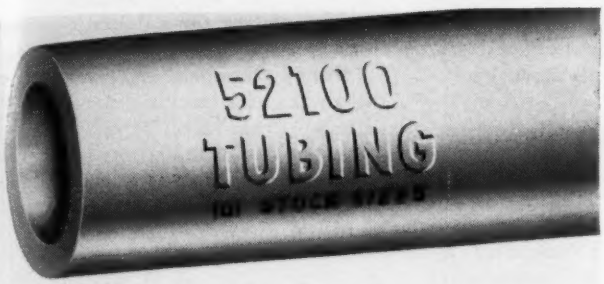

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While in operation, the bottom half of each tube or the lower 90-degree portion can be made to radiate a hotter heat if desired, or it can be made to supply a uniform heat from any portion of its 180-degree area. The tube is designed to employ all low-cost fuels, but can be adapted for economic operation with medium to high-cost gases by means of a recuperator developed for the purpose.

Other applications currently involving the new tube include carbon restoration and strip annealing. The development also can be utilized as the heat source in heat treating low carbon steels up to carburizing and malleablizing temperatures—ranges of 1200 to 2000° F.

Gear Lubricants Symposium

EXPERIENCES and data on the properties of industrial gear lubricants which may need to be investigated in connection with the establishment of test methods, nomenclature and specifications are present in a three-paper symposium on industrial gear lubricants available from American Society for Testing Materials, Philadelphia.

An evaluation of heavy duty gear oils on each of three machines, data on various lubricants used in a steel plant and an application of the cathode ray oscilloscope in tracking down difficulties are the subjects covered. The 24-page publication is available from society headquarters, 1916 Race St., Philadelphia 3, Pa.

Chemists' Association Bulletins

SEVEN sections of manual sheet W-2, entitled, "Water Pollution Abatement Manual for Insoluble and Undissolved Substances", published by Manufacturing Chemists' Association Inc., Washington 5, D. C., include: Effect on receiving waters, permissible concentrations, removal of solids from waste, sludge digestion, sludge dewatering, sludge disposal, and equipment sources.

Also available from the association is manual sheet TC-7, "Tank Car Loading and Unloading Platforms". Sections on tank car standardization and types of approach platforms are included.

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AN ACCURATE and controlled amount of grease is delivered into an automobile steering bearing by a device for use on an automobile assembly line. Developed by J. N. Fauver Co. Inc. of Detroit, the equipment consists of an air regulator, pressure gage, air filter, air lubricator and manually controlled operating valve, air and measuring cylinders and valves for automatic operation.

Pushing the operating lever allows the air to enter the air cylinder which actuates the measuring cylinder. When the end of the stroke is reached and the total measured volume has been delivered, both cylinders automatically return to position.

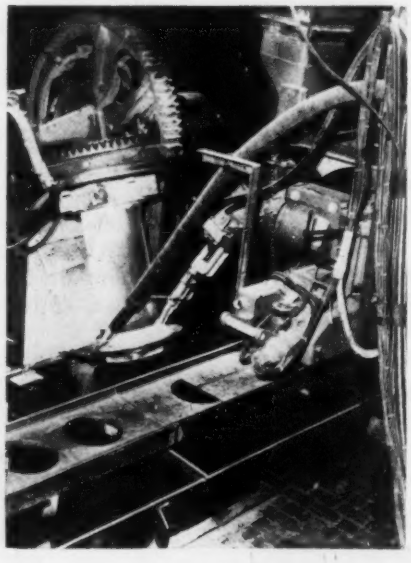
Crane Built for Light Work

POWERED by an electric starting diesel engine developing 72 hp is a 10-ton locomotive crane, developed for high speed work on those jobs where a heavier unit would be less economical. Rated capacity is with a 40-foot boom at a 12-foot radius, according to its manufacturer, American Hoist & Derrick Co., St. Paul, Minn.

Crane has a full vision cab, tandem band air-controlled clutches and will perform all operations simultaneously. The three-speed selective transmission is said to allow shifting from one speed to another while the crane is in motion. Welded construction, ball and roller bearings, gears running in oil and quick-action boom hoist are additional features.

ELEVATOR WELDING POSITIONER

DOUBLES PRODUCTION



Welding positioner after being raised by air-operated elevator to compensate for change in level when pump liner shell is turned 180 degrees. Gland ring previously has been welded from the top

A STANDARD welding positioner mounted on an air piston-elevator by engineers at Gardner-Denver Co., Quincy, Ill., has enabled the company to weld a gland ring at top and bottom to a pump liner shell without removing it from the positioner and without changing the level of the Unionmelt welding head. The pump liner assembly is a tubular shell of alloy steel measuring 8¾ inches in diameter and 26 inches in length. It has a fairly thick ring pressed into one end.

Gland ring measures 1½ inches wide and about ⅞-inch thick. It is welded to the shell about 2 inches from one end. Inner edges of the ring are machined to provide welding Vs on top and bottom. Each weld is about 28 inches in length and is made by the Linde Air Products Co. welding machine in 2½ minutes.

Liner assembly is clamped to the face plate of the positioner and a sheet metal collar, fastened around the gland ring, supports the composition which covers the welding zone. Positioner is lowered into a well beneath the floor level, this bringing the top of the gland ring even with the welding nozzle. Carriage is then moved into place and the positioner turns the part at the proper speed while the first weld is made.

About 1 minute is required to move the welding head clear of the assembly, elevate the positioner and turn the face plate and piece upside down, bringing the bottom of the gland ring into the downhand position and at the proper elevation for the second weld. Gardner-Denver reports that when the liner assembly was welded by hand, the best production that could be expected was about two units per hour. Using the special positioner and the Unionmelt machine, production was increased to four units per hour.

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Steel Specifications—*Concluded from Page 63*

steel according to its chemical composition and that they are not specifications in the sense that the classification number alone on a drawing describes completely the steel required. This deficiency has been met in two ways: First, by the use of SAE numbers on drawings together with whatever additional notes may be necessary to describe completely the material for procurement purposes. This method has two disadvantages: First, it clutters up drawings with notes, many of which are alike and all of which are similar; second, as the trade practices change, quality descriptions and terminology change. When an attempt is made to keep these notes up to date, the drafting room complains bitterly because of the large number of drawing changes required.

The second method is the use of purchase specifications written by the consumer. These take many forms but all aim to set forth clearly the customer's requirements in terms of current trade practice. The writing and keeping up to date of such a system of specifications is often a sizable task. Large organizations are staffed for such work but the smaller organization often is not so fortunate. It may use almost as many classes or grades of material as the large organization but it is not staffed to do the work of specification writing.

Hardenability Bands and H-Steels—In the case of alloy steels, an important advance toward more complete specifications has been made. No account of the recent work of the joint activities of the technical committees of SAE and AISI would be complete without mention of the development of the H series of alloy steels and the corresponding hardenability bands because this represents a really new development in steel specifications. At the same time, it is an illustration of co-operative development at its best.

It is fundamental that if steels are to be heat treated satisfactorily in mass production, behavior of all materials purchased to a particular specification must be substantially uniform in behavior. The usual method of providing this behavior is by control of chemical composition and through the years the tendency has been to narrow the composition limits in an effort to obtain ever closer control of behavior. This procedure has reached the point of diminishing returns for two reasons: First, any further narrowing of the specification limits of the regularly determined elements imposes undue operating restrictions on the mills and, second, the method itself is not and cannot be fully effective. The reason is that, for heat treating purposes, a measure is needed which is a summation of all the factors affecting the behavior of the steel.

End-Quench Test—The end-quench hardenability test originally devised by Jominy and Boegehold has proved to be a very effective means of measuring hardenability of alloy steels. It does exactly what is needed, that is, it gives a summation of the effect of all of the elements or characteristics of the steel which affect its hardenability. As we increase the number of alloying elements in steel, the value of such a test increases.

Limits in the form of hardenability bands showing the tentative minimum and maximum hardenability of each grade of steel was first published in July, 1944, as a joint publication of the SAE and the AISI known as "Contributions to the Metallurgy of Steel—No. 11." The present issue of June, 1947, contains charts for 61 steels and others are in process of preparation. The experience with this system has been sufficiently satisfactory that it is now possible to remove the tentative status of these H-bands. They will shortly become permanent specifications. The steels purchased under this scheme are known as H-steels. They are designated by using the ordinary SAE number followed by the letter H; for example, SAE 8640-H.

In establishing these specifications, two things were hoped for: First, for the user, it was desirable to provide closer control of behavior than had been possible by chemistry alone; second, for the producer, it was hoped that the scheme would prove less troublesome to the mills. Both hopes have been fulfilled.

When these bands were first published, the complaint was made that they were too wide. This complaint may have been justified in some cases but in others it arose from the fact that, for the first time, consumers could plainly see just what the hardenability range actually is. The accumulation of more data makes it possible to put the matter on a sounder basis statistically with the result that some of the bands have been narrowed. There is no reason to believe that this process is complete.

Meaning of Hardenability Specifications—What these hardenability specifications mean in the form of closer control of behavior is shown in Figs. 1 to 3 adopted from an article in the October, 1948, issue of the SAE Journal. Fig. 1 shows the difference in distance on the Jominy bar at a hardness level of Rockwell C 45, first when 8640 is purchased to narrow chemistry limits and, second, when purchased on a hardenability basis with widened composition limits. Fig. 2 shows, for the same steel, the range in Rockwell hardness values at a given distance on the Jominy bar, in this case four sixteenths, for the two methods of specification. Fig. 3 shows similar data for a Jominy distance of eight sixteenths.

It should be pointed out that this method of specifying steel does not eliminate the necessity for chemical composition in specifications. Originally, ill-founded over-enthusiasm for hardenability specifications caused some to assume that the scheme would eventually replace chemical specifications entirely. This is not likely to be true for a long time to come, if ever. If hardenability alone were specified, although similar end results could be had from a variety of steels, the processing necessary to achieve those results would vary so widely that manufacturing would be seriously affected and material cost would be unpredictable. Once the type as governed by chemical composition has been determined, hardenability is used to apply the necessary degree of close control for uniform behavior.

At the present time, it has not been possible to extend this system to the carbon steels. The Jominy test works reasonably well on some of the medium carbon steels, but in its present form, it is generally quite unsatisfactory on low carbon steels.

Safe Bulk Shipment

NAILS, screws, nuts, bolts, rough castings and similar materials, either in bulk or package, may be shipped safely at a savings in materials costs and tare weight in the Belsinger box, made by Hinde & Dauch Paper Co., Sandusky, O. Box gets its great strength, according to the company, from its multiwall construction in which the box can be designed with corrugations running in the desired directions for maximum compression strength.

—o—

AS a further step in its program to get more workers to wear safety shoes, Hy-Test Safety Shoe Division, International Shoe Co., St. Louis, is making available a safety shoe displayer, especially designed to encourage workers and prospective wearers to handle and examine the shoes.

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Everybody's sold on PARKER-KALON SIZE-MARKED socket head cap screws

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like 'em because they can spot the right size at a glance. No need to waste time guessing or gauging.

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ONLY ON PARKER-KALON Socket Screws will you find the Size-Mark and Gear Grip . . . developed after extensive study of shop practice to speed work. Samples Free, on request. See why P-K "years ahead" Socket Screws can put your product out front, assembly-wise as well as sales-wise. Send for Stock List Now. Parker-Kalon Corporation, 200 Varick Street, New York 14, N. Y.

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AVAILABLE THROUGH ACCREDITED DISTRIBUTORS IN EVERY INDUSTRIAL AREA

*U.S. DESIGN PAT. NO. 126,409

Grease Lubrication

(*Concluded from Page 64*)

where it is and not seep out.

One of the greatest contributions in the use of grease has been to create longer machine operation periods because of the lasting qualities of grease lubrication overcoming the frequent shut-down periods required for oil application. Another factor favoring grease usage through longer operating periods is safety.

With today's specialized petroleum products, the following points are worth considering to determine: Type of basic mechanism, method of application best suited, speed of bearing, temperature, load or pressure, water, acid or other specific conditions.

Against this determination, points where grease can be used are considered: Where oil cannot be retained on operating surfaces because of slow action and high pressures; where it is necessary to have lubricant remain on operating surfaces, both during motion and when the machine is idle; where it is necessary to operate bearings having little or no attention for long periods of time; where bearings are subjected to repeated shocks; where there is a probability that oil would drip or splash; where high operating temperatures are encountered; where there is contact with water. Grease also serves to guard against the ingress of foreign materials.

Yardstick for Lubrication — A study of the above considerations will enable us to apply a further yardstick to decide: Where to lubricate, what product to use, how often to lubricate, how lubricant should be applied. These four points represent the biggest problem with which industry is confronted not only in machine tools, but with practically every bearing in America.

In the development of grease usage it is well not to overlook the fact that American ingenuity and the willingness to "try out ideas" has contributed as much if not more than the laboratory scientist or chemist. As a matter of fact, the chemist and the scientist have worked primarily on the job of refining the "good things" developed largely through field effort in the form of "trial and error".

It is a combination of the two that has brought us from the use of water, the whale and the hog to the present high development in the petroleum industry.

Fig. 1 shows a fitting developed to prevent excessive lubrication of motor bearings, causing lubricant to be expelled through a slot or port in the fitting so that lubricant backs up when the bearing area is approximately 40 per cent filled. Being open to atmosphere also permits any surplus lubricant to be expelled in the event of expansion through heat. Other fittings have been developed to permit excess lubricant to be drained from a bearing in the event of pressure created through either heat or friction.

Figs. 2 and 3 show machines on which grease lubrication has been employed with complete satisfaction. No two cases may be identical. Two machines of the same design may not have exactly the same lubrication requirements.

From data presented before 4th annual convention, American Society of Lubrication Engineers, New York, April 11-13, 1949.

LOADING TIME CUT IN HALF: Outgoing shipments of air conditioning equipment weighing from 1 to 10 tons are handled in one-half the time as previously with an electric hoist which has a lifting speed of 12 fpm. At the W. W. Sly Co., Cleveland, the cases of equipment are transported from storage zones to street truck or rail car and lowered into position by the hoist, made by Yale & Towne Mfg. Co., Philadelphia. Hoist is trolley-mounted and travels the length of the shipping platform on an overhead I-beam, which is also trolley-mounted for two-way travel and close spotting

Acid-Resistant Cement

UNUSUAL water and acid resistant qualities are given to concrete by addition of calcite, a metamorphic limestone, according to Vaagsoy Cement Works of Sunnore, Norway. It is reported that four parts of cement to one part of calcite mixed into concrete forms a building material which is resistant to salt water, weather and acids.

Discovery of a cement dock built in 1913 which showed no indications of water action started an investigation which showed that the fishermen who built the dock had unknowingly mixed calcite into the concrete. It is stated that a series of laboratory experiments in the last two years have indicated that calcite may in reality be the key to a highly efficient building material.

A pleasant note for tubular needs

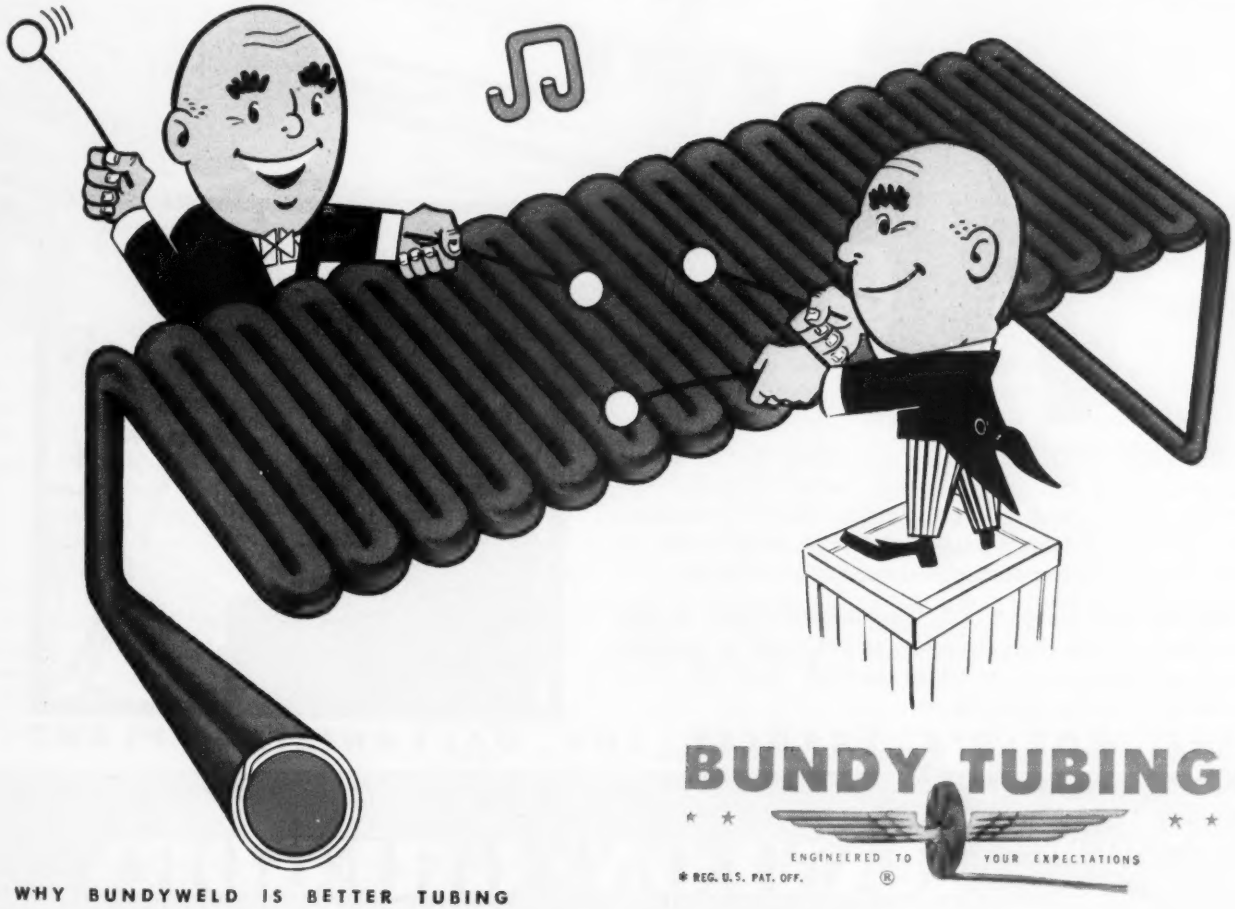
Like to add a pleasant note to your present tubular applications—a note of better design, faster production, lower costs or higher quality?

If you would, better sound out Bundyweld* Tubing!

Made of steel, Monel, or nickel by a patented process, leakproof, vibration-resistant Bundyweld is manufactured to close tolerances always. Strong yet ductile, it bends without collapsing or weakening structurally, and can be machined or fabricated easily and readily.

Tubular parts for toys, refrigeration, radiant heating, television, automobiles, machine tools, ranges . . . these are only a few of the fields that find Bundyweld ideal for their tubular needs.

If you have a tubular design or production problem, chances are that this miracle tubing of industry can strike a responsive chord in its solution. Why not give it a try? Contact your nearest Bundy representative listed below, or write direct to: *Bundy Tubing Company, Detroit 14, Michigan.*



BUNDY TUBING

ENGINEERED TO YOUR EXPECTATIONS

* REG. U. S. PAT. OFF. ®

WHY BUNDYWELD IS BETTER TUBING

1 Bundyweld Tubing, made by a patented process, is entirely different from any other tubing. It starts as a single strip of basic metal, coated with a bonding metal.

2 This strip is continuously rolled twice laterally into tubular form. Walls of uniform thickness and concentricity are assured by close-tolerance, cold-rolled strip.

3 Next, a heating process fuses bonding metal to basic metal. Cooled, the double walls have become a strong ductile tube, free from scale, held to close dimensions.

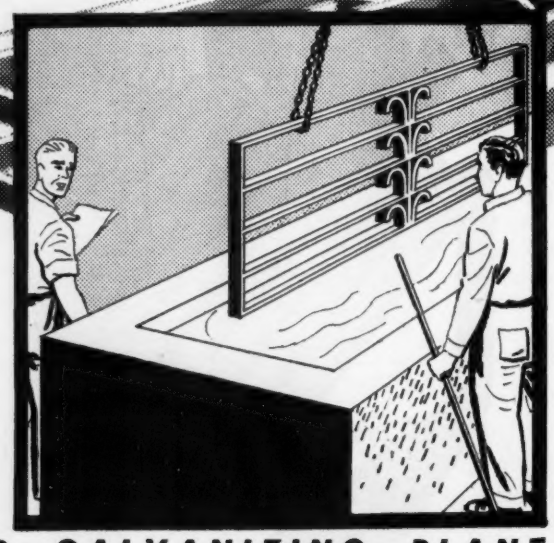
4 Bundyweld comes in standard sizes, up to ⅝" O.D., in steel (copper or tin coated), Monel or nickel. For tubing of other sizes or metals, call or write Bundy.

BUNDY TUBING DISTRIBUTORS AND REPRESENTATIVES

Cambridge 42, Mass.: Austin-Hastings Co., Inc., 226 Binney St. • *Chattanooga 2, Tenn.:* Peirson-Deakins Co., 823-824 Chattanooga Bank Bldg. *Chicago 32, Ill.:* Lapham-Hickey Co., 3333 W. 47th Place • *Elizabeth, New Jersey:* A. B. Murray Co., Inc., Post Office Box 476 • *Philadelphia 3, Penn.:* Rutan & Co., 404 Architects Bldg. • *San Francisco 10, Calif.:* Pacific Metals Co., Ltd., 3100 19th St. • *Spokane 6, Wash.:* Eagle Metals Co., E. 330 Trent Ave. • *Toronto 5, Ontario, Canada:* Alloy Metal Sales, Ltd., 881 Bay St.

BUNDYWELD NICKEL AND MONEL TUBING IS SOLD BY DISTRIBUTORS OF NICKEL AND NICKEL ALLOYS IN PRINCIPAL CITIES.

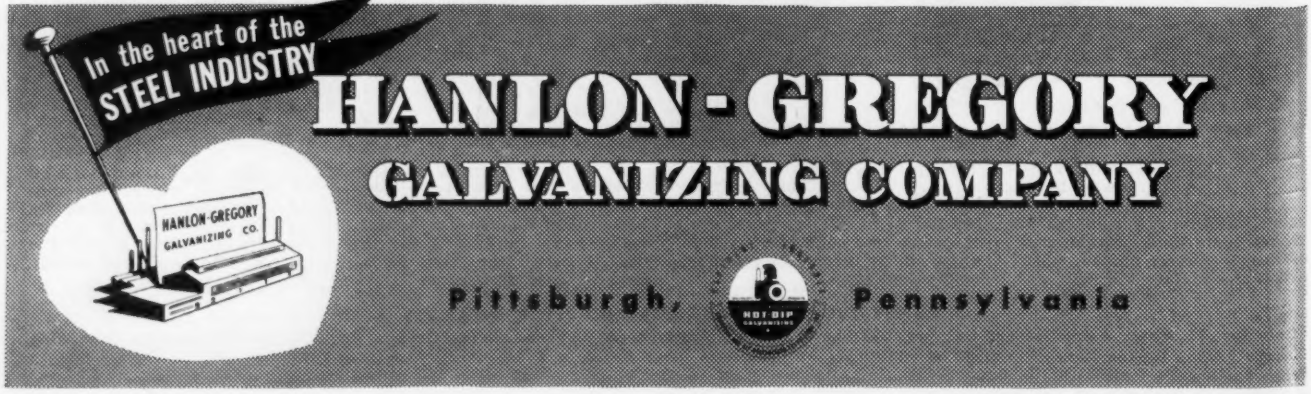
Hot-Dip Galvanized Bridge Railing *Lasts Longest*



YEARS AND YEARS of service are added to the life of bridge railings and other exposed installations that are Hot-Dip Galvanized by the Hanlon-Gregory process. This method of fusing base metal with molten zinc is your solution to expensive maintenance problems.

The World's Largest Job Galvanizing Plant, in the very heart of the steel industry, is prepared to provide the *best proven prevention* against rust—for your products—in any quantity.

THE WORLD'S LARGEST JOB GALVANIZING PLANT



GALVANIZING . . . PICKLING AND OILING

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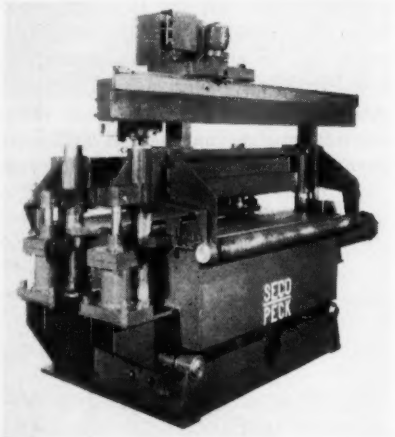
New Products and Equipment

Strip Splicer

Sheared ends of coils are welded together to form a continuous strand through the processing lines and for subsequent cold reduction with the Seco-Peck semiautomatic strip splicer manufactured by Steel Equipment Co., 2890 E. 83rd St., Cleveland, O. Machine's strip steel capacity ranges from 0.060 to 0.183-



inch and has an effective working width of 56 inches. Splicer consists of four units: Coil end positioner, coil splicer or welder, welding equipment, flux reconditioning unit.

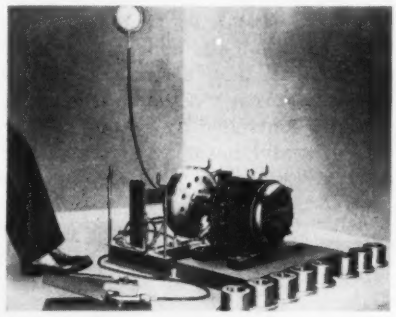
Function of each unit is arranged so that combined operation cycles are completed in the shortest possible time. The welding anvil in a raised position acts as a stop-gage for the coil ends and as a backing up fire-strip in its lowered position. To make the weld, the operator presses one pushbutton, limit switches starting and stopping the weld according to the strip width. Operation of all moving parts is accomplished through hydraulic cylinders.

Check No. 1 on Reply Card for more Details

Hydraulic Dynamometer

Large electric motors may be load tested with the model SA-484 hydraulic dynamometer of 30 to 300 foot-pounds capacity, made by Wagner Electric Corp., 6382 Plymouth Ave., St. Louis 14, Mo. Unit, placed directly on the floor, is provided with jack screws for raising it to the correct height for connection to the motor to be tested, which is secured to a bedplate, subbase or rail. Adapters for 1⅛ to 2⅞-inch motor shafts are furnished. The test gage and foot control cylinder for operation can be placed in the most convenient positions.

Tests that can be made include idle, pull-in, pull-up, full-load and locked. Locked test can be made



without having to shut off the motor to insert a locking pin or similar device. Dynamometer cannot be used to make a heat run on a motor.

Check No. 2 on Reply Card for more Details

Spring Steel Fastener

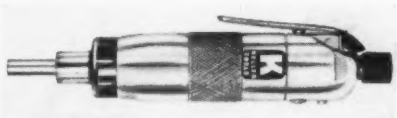
Tinnerman Products Inc., 2035 Fulton Rd., Cleveland, O., is introducing the Speed Clip spring steel fastener which makes unnecessary the drilling of breaker strips, requires no special tools and cuts down on assembly time. Appearances are improved in some installations by the completely concealed fastener.

In initial production, parallel ribs are molded at regular intervals along the plastic breaker strip. Legs that form the base of the clip are pressed under the shoulders of the rib and the fastener is held securely by the spring action of the legs which presses the four barbs of the base into the plastic. Final assembly, the breaker strip is snapped into position.

Check No. 3 on Reply Card for more Details

Pin Riveter

Keller Tool Co., Grand Haven, Mich., is producing the pin riveter for light riveting operations with soft metal tubular and standard rivets. It may also be used for setting



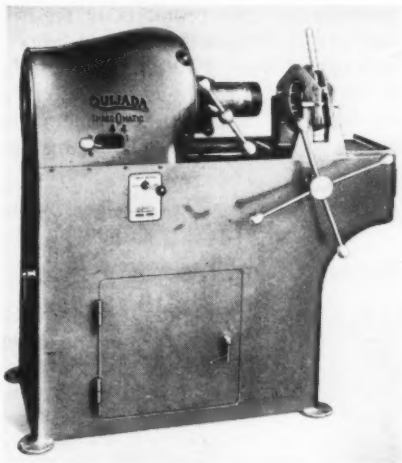
small drive screws, driving brads in assembly operations and in light peening and scaling operations on thin sheet metal sections.

Weight of the riveter is 13 ounces and length is 6 1/16 inches. Piston diameter is 19/32-inch and stroke is ½-inch. Tool has a speed of 9000 blows per minute. Standard equipment consists of a blank rivet set, with special rivet sets available on order.

Check No. 4 on Reply Card for more Details

Pipe Threading Machine

Mechanically-operated automatic chucks account for the high speed of the Thred-O-Matic, 44-inch pipe threading machine announced by



Quijada Tool Co., Los Angeles, Calif. Range of the machine is from ½ to 4 inches. Operator is required to lay pipe in the spindle and flip a switch and the pipe is chucked, centered and turned. Only maintenance required is resharpening of the four front and four rear jaws.

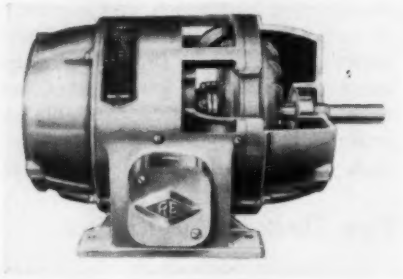
Cutter assembly is mounted on the front housing plate to allow operator to place a fitting on the pipe immediately after threading. An instantaneous flow oil pump is driven directly from transmission. Quick opening die head utilizes four high speed dies in each head. Power is furnished by a 3 hp, 220-v motor which has automatic magnetic switches for overload protection. Eight speeds are available with the 4-speed transmission and the 2-speed motor.

Check No. 5 on Reply Card for more Details

Electric Motor

An integrally designed electric fluid-drive motor, offered by Reuland Electric Co., Alhambra, Calif., offers advantages where loads require smooth acceleration, protection from jamming and shock or are difficult to start. Units utilize regular Reuland electric motor frames and end bells, eliminating need for

special parts. Loads are accelerated easily because the motor is practically up to speed before any load is applied. A savings in power is accomplished because of a reduction in starting current.



Motors are available in standard foot mounted or round body frames and all units can be mounted horizontally or vertically. Offered are ½ to 10 hp units. They are available in combination with motoreducers in either single or double reduction types.

Check No. 6 on Reply Card for more Details

Forming Machine

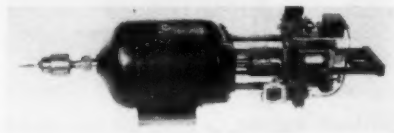
End of a 4-inch diameter tube with ¼-inch wall thickness may be completely closed in 10 seconds with the Westin process automatic forming machine manufactured by Federal Machine & Welder Co., Warren, O. With the use of removable dies, the general purpose machine is suitable for a variety of job applications. For short runs of special work, manual operation is also provided.

Traverse speeds are infinitely variable from 0 to 100 inches per minute and the 8-step spindle speed ranges from 40 to 150 rpm. The three segment die and the three transformers permit equal loading of each phase of the conventional three phase system. Although generally built to nominal sizes accommodating work from ¾ to 4-inch, 4 to 8 inches and 8 to 16 inches, machines can be built for working tubing of almost any diameter or wall thickness. Brass, aluminum, copper, carbon steels and most alloy steels including stainless may be worked by the Westin process.

Check No. 7 on Reply Card for more Details

Tapping Unit

Rotor of a new air-operated tapping unit offered by Black Industries, 1400 E. 222nd St., Cleveland 17, O., actually shifts for the full length of stroke so that the motor shaft can be made solid, not splined, for rigidity and accuracy. Unit is operated through a double-acting air cylinder controlled by a built-in four-way air valve needle. Adjustable needle valves control the air flow so that the tap follows its own lead without chamfering the first threads.



Reversal is obtained through a secondary air cylinder, operating from the same air supply as the first cylinder which used a limit switch to reverse the motor when the tap has reached the proper depth at the same time the main air cylinder starts the return stroke. Depth control is held within 0.001-inch to eliminate danger of tap breakage. Units are designed to work in any position and at any angle.

Check No. 8 on Reply Card for more Details

Scarfing Torch

Weighing only 6 pounds, a new oxyacetylene scarfing torch for steel mill work, offered by Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y., comes complete with starting rod device. The high gas capacity of 5000 cu ft per hour at 100 psi permits maximum output per man hour.

Constructed of stainless steel, Monel and aluminum, the torch is of the two-hose type with triangular tube arrangement. Torch head is of type 304 stainless steel, as are the tubes. Wear ribs on both sides of the torch head increase work life. Torch is offered in 46 and 52-inch length. Style 211 acetylene scarfing tip, which has flared oxygen orifices in order to obtain a wider kerf, is offered in sizes 17 and 18. Available in the same sizes is style 117, for use with natural gas.

Check No. 9 on Reply Card for more Details

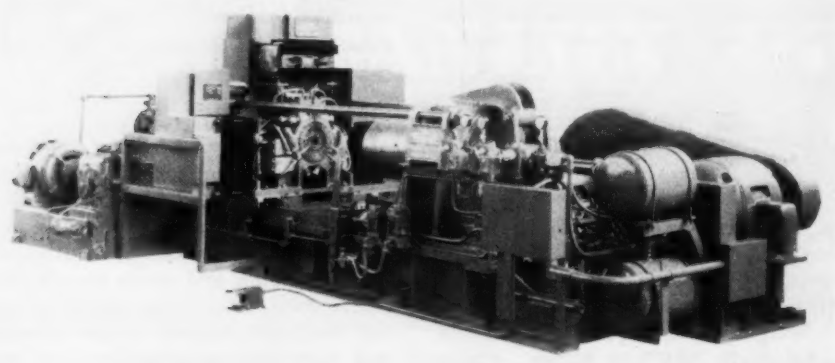
Cable Cutter

Imparting a slicing rather than a pinching action to assure sharp, clean cuts, a portable hand operated cutter introduced by Beverly Shear Mfg. Co., 3001 W. 111th St., Chicago, Ill., is adapted to cutting hollow core material, steel reinforced rubber hose, heavy electrical cable, conduit, etc. A snap-action hold down permits size adjustments to be made easily. Heavy cable is easily cut because of a double link which compounds the down stroke. Cutter blades are adjustable to compensate for wear and resharpening.

Check No. 10 on Reply Card for more Details

Tool Grinder

Work holding fixtures may be changed in a few seconds and complete setup made within 1 or 2 minutes on the model A Gopher tool grinder, made by Gopher Machine & Engineering Co., 3333 University Ave. S.E., Minneapolis 14, Minn. Designed to sharpen all turret lathes and screw machine tools, it will handle 90 per cent of all tool sharpening jobs. Work holding fixtures are so



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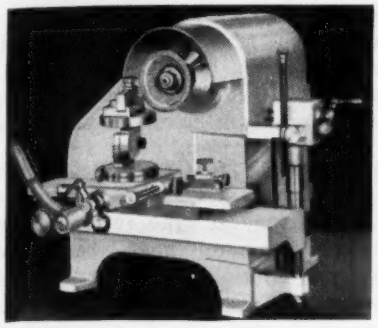
designed that each cutting tool can be held in the same manner in which it is held in the die-head or tool holder while at work in the machine.

Spindle is driven by a V-belt from a ¼-hp motor. Front spindle bearing consists of a duplex, preloaded ball bearing which eliminates end



play and chatter. Weighing about 125 pounds, grinder may be transported from one department to another. Included with the machine are flared cup and straight wheel, universal vise and diamond dresser.

Check No. 11 on Reply Card for more Details

Car Shakeout

Designed to unload up to 15 hopper-bottom cars of granular material in a day, the Robins model GS car shakeout, made by Hewitt-Robins Inc., 270 Passaic Ave., Passaic, N. J., weighs less than 3½ tons. With a hoist, yard crane or other device capable of lifting this weight, the shakeout is placed on the car, not attached to it.

Only one or two men are required, one to operate the hoist, to open and close hopper doors and to start and stop the shakeout cycle. Power is furnished by a 10 hp motor. Shakeout measures 11 feet long, 5 feet 7⅛ inches wide and 3 feet 5¾ inches high.

Check No. 12 on Reply Card for more Details

Storage Rack

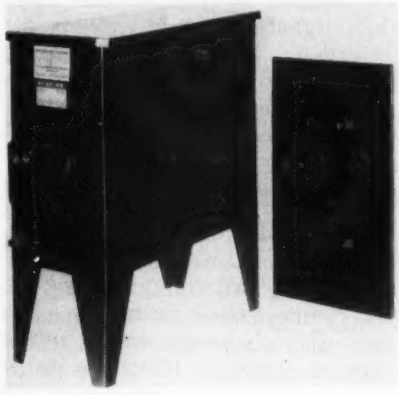
Constructed of formed channel steel vertical frames, bolted or welded to desired specifications at the factory is racking for stock room, warehouse, drums or barrels, tools or dies, made by American Steel & Wire Works, Chicago, Ill. The Storack frames are shipped ready to use with additional formed channel steel horizontal members up to 20 feet in length as needed to connect the frames into desired storage sections.

Nut and bolt fittings, movable and adjustable in the formed channel members, are used to fasten the frames and horizontal members together into any desired length or spacing. It is available in junior size for light to medium loads and standard size for medium to heavy loads. It may be used where conditions require racking that can be extended, moved or re-used.

Check No. 13 on Reply Card for more Details

Still and Degreaser

Functioning as a 5-gallon-per-hour still and as a small degreasing machine is the model ST-1 unit offered by Phillips Mfg. Co., 3475 W. Touhy Ave., Chicago 45, Ill. Electrically heated and composed of two compartments, the unit's distillation rate will vary slightly depending upon whether trichlorethylene or perchlorethylene is used. First compartment



is heated with strip heaters and boils the solvent, the vapors flowing over to the second compartment where they are condensed by a small cooling coil.

A thermostat in the boiling sump prevents overheating in case of excessive contamination. Unit can be used as a degreaser by immersing the parts in the agitated boiling sump and then holding them in the vapor area to rinse and dry. It is 36 inches long, 17 inches wide and 40 inches high. Inside dimensions of each compartment are 11 x 14 x 15 inches.

Check No. 14 on Reply Card for more Details

Punch Unit Adapter Setup

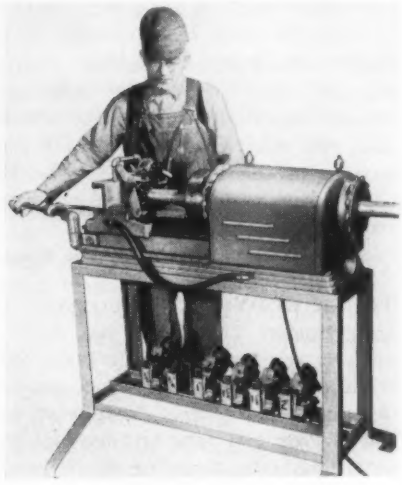
Developed by Wales-Strippit Corp., 345 Payne Ave., North Tonawanda, N. Y., is a new adapter setup for use with Wales type CD hole punching units which assures accuracy of hole location by mounting and permanently doweling the unit to the die set. The type CD units may also be used in combination with blanking and forming dies and provide easier mounting for permanent dies.

Four steps mount the hole punching unit in a set with adapters: Drill and tap mounting screw holes in the die set; mount punch assemblies in position and dowel; align die assemblies and punch assemblies using locator ring and dowel; locate gages and setup is ready to operate. Punching units will punch round or shaped holes up to 1½ inches in diameter in ⅛-inch mild steel.

Check No. 15 on Reply Card for more Details

Pipe Threader, Cutter

Cutting, threading and reaming operations may be performed on pipes to 2 inches in diameter and threading on solid rounds to 1½ inches in diameter with the Threadfast machine announced by Peerless Machine Co., Racine, Wis. A new type Roto-Lok wrenchless chuck, in effect a rapid acting rotary vise, makes it possible to rapidly chuck and unchuck work as the spindle rotates. Pipes, solid rounds, and bolts are quickly centered and rigidly held. Pipe diameters ⅛ to 2 inches and



bolt diameters ⅜ to 1½ inches can be placed through the rear centering unit and the wrenchless chuck.

After a thead is cut and the die head clamp released, the pipe is easily and quickly removed by hand. The machine is designed to handle new or old pipe. Carriage is accurately gibbed to prevent misalignment and chatter. All die heads are free floating units which permit immediate and correct chaser contact. Fixed length, monotype, high speed steel chasers are hobbed with correct helix angle and ground.. Design of threading chasers permits easy regrinding.

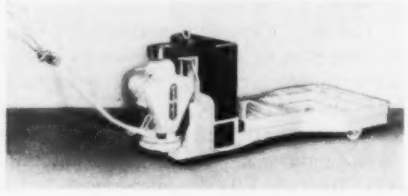
Check No. 16 on Reply Card for more Details

Motorized Hand Truck

Operated by two 12-v motors hooked up in series, a motorized battery-operated walkie truck made by Moto-Truc Co., 1953 E. 59th St., Cleveland, O., is reported to have a capacity of 10,000 pounds. Truck has

chain and gear drive and has open platform for handling cores in foundries. It is 36 inches wide at its widest and tapers down to 27 inches. It is 60 inches long.

A turn of the wrist on the roller type cross handle gives two speeds forward and two speeds reverse.



Pushbuttons in the end of the handle control a hydraulic lift. Dead man controls are incorporated. Double motor unit can be applied to other types of Moto-Trucs built to move heavy loads.

Check No. 17 on Reply Card for more Details

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COKE IGNITER: Whiting Corp., Harvey, Ill., offers the Whiting-Mason electric coke igniter which does not use wood, gas or oil for burning-in the cupola coke bed. It uses compressed air and one welding rod for each light.

Check No. 18 on Reply Card for more Details

TRUCK BODY: J. C. Corrigan Co. Inc., Boston 22, Mass., has developed a self-loading truck body for transporting coal, coke, sand, gravel or similar materials. Designated as Corboveyor, it can be divided by partitions into three or more compartments.

Check No. 19 on Reply Card for more Details

VALVE: Known as the Homestead-Reiser Self-Sealed valve, a new valve offered by Homestead Valve Mfg. Co., Coraopolis, Pa., has a wedge action in the cylindrical slug which not only adjusts itself for wear, but also keeps sealing surfaces of plug and body in intimate contact at all times.

Check No. 20 on Reply Card for more Details

DRUM LIFTER: Lifters for handling open and closed steel drums in the vertical position, by crane or hoist, are announced by Palmer-Shile Co., Detroit 27, Mich. They are of all steel construction with a heavily welded chain.

Check No. 21 on Reply Card for more Details

CARRIER: Usefulness of lift-type tractors used around industrial plants is extended by the new Carry-Lift, produced by Pittsburgh Forgings Co., Coraopolis, Pa. It is attached in a few seconds to Ferguson, Ford and other tractors through the regular implement suspension points. It will handle loads as heavy as 700 pounds or the full capacity of the tractor lift.

Check No. 22 on Reply Card for more Details

SWITCH: A heavy duty splash-proof precision switch with a plate type actuator is announced by Micro Switch, Freeport, Ill. While designed for locations subject to splash of oil, water and coolant, it is advantageous on equipment where operator safety demands two-hand control switches.

Check No. 23 on Reply Card for more Details

BALL BUSHING: Thomson Industries Inc., Manhasset, N. Y., announces the development of a new ball bushing suitable for use where shaft rigidity and load capacity are important. This bearing is designed primarily to give antifriction support to linear motions along 1½-inch diameter guide rods or reciprocating shifts.

Check No. 24 on Reply Card for more Details

ELECTRODE: No. 299 alternating current-direct current electrode introduced by All-State Welding Co. Inc., White Plains, N. Y., combines resistance to corrosion with a tensile strength of 110,000 to 120,000 psi as welded. It is recommended for welding of vanadium-moly spring steels, nickel-clad steels, medium carbon and air-hardenable steels.

Check No. 25 on Reply Card for more Details

ABRASIVE: A special treatment of the carbon to provide a softer, more malleable body is the feature of a new shot and grit offered for metal cleaning. Made by National Metal Abrasive Co., Cleveland, O., it is known as Permabrasive.

Check No. 26 on Reply Card for more Details

WELD NUT: The new type Gripco Pilot projection weld nut is designed for quick positioning or centering at the spot where it is to be welded to the metal. A circular collar with a diameter slightly less than the bolt hole is provided on the weld nut. This is inserted into the bolt hole and automatically centers nut. Nuts are manufactured by Grip Nut Co., Chicago 4, Ill.

Check No. 27 on Reply Card for more Details

ANALYZER: For measuring atmospheric contaminations and for process control, the Lira gas and liquid analyzer has been developed by Mine Safety Appliances Co., Pittsburgh 8, Pa. It detects minute as well as heavy concentrations of various atmospheric contaminants and may be made selective so as to measure one specific product in the presence of several.

Check No. 28 on Reply Card for more Details

ELECTRODE: Eutec-Hand-Omatic is an alternating current-direct current, no-gap electrode announced by Eutectrc Welding Alloys Corp., New York, N. Y. It is merely pressed against the metal and drawn straight along, like a pencil, without any back and forth or weaving motion.

Check No. 29 on Reply Card for more Details

PRESSURE GAGE: Bristol Co., Waterbury 91, Conn., announces a new mechanical type recording absolute pressure gage based on a new principle involving a pressure-sealed lever arm so constructed that it is friction-less, entirely free from lost motion and free of turning moments due to changes in differential pressure across it. Known as the Series 500, it is offered in ranges from 0 to 20 millimeters mercury up.

Check No. 30 on Reply Card for more Details

BALANCER: Weighing for sulphur, silicon, copper, vanadium molybdenum and other tests to 1/20 of a milligram with analytical balance accuracy is possible by a new direct reading instrument called the Gramatic balance, made by Fisher Scientific Co., Pittsburgh, Pa.

Check No. 31 on Reply Card for more Details

WEAR STRIPS: Aluminum-bronze wear strips for use on boring bars and driving tools piloted in bushings are offered by Scully-Jones & Co., Chicago, Ill. Dissimilarity of material permits smaller clearances between steel bushings and strips. They are available in 6-inch lengths and five standard sizes.

Check No. 32 on Reply Card for more Details

HYDRAULIC PUMPS: A new series of Lear-Romec rotary gear hydraulic pumps, offered by Lear Inc., Elyria, O., is designed to meet specific flow and pressure requirements of tractors, trucks and construction tools and is applicable to other heavy duty hydraulic applications.

Check No. 33 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

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Market Summary

STEEL BUYING at the accelerated rate which set in a few weeks ago continues. When the upturn occurred much of it was attributed to protective buying against a threatened strike of steelworkers. As orders now being placed with mills cannot be delivered before the mid-September strike deadline it is evident consumers have been impressed with the inflationary aspects of the overall business outlook and are now covering because they believe conditions ahead justify such action. Contributing to the upturn in demand are completions of inventory reductions, a conviction there will be no immediate steel price cuts, and an improvement in some fields, notably the household appliance industry.

There is speculation as to whether this increased buoyancy in sentiment will continue in event a strike is averted and the automotive industry, the outstanding factor in protective buying, slackens its ordering and depends increasingly on its enlarged inventories.

PRICES—Studying steel price possibilities, some observers say: If steelworkers' wages go up, costs go up, and therefore prices will rise too. If steel mills are struck, scarcity develops, and therefore prices will remain firm, at least for the rest of the year. A survey of purchasing agents reveals, however, a unanimity of belief that steel prices will trend downward next year unless settlement of the current steel wage dispute sets off inflationary action.

SUPPLY, DEMAND— In tightest supply of all steel products are galvanized sheets, cold-rolled carbon sheets, and standard and line pipe. Stringency in galvanized sheets is being accentuated by urgent requirements of the government grain storage bin program. Oil country tubular goods demand for the fourth quarter is off substantially as result of a move to reduce field inventories. Plates continue in good demand in some areas despite reduced needs of carbuilders and ship repair yards. Demand for structurals has been lagging, although some upturn in public work is noted. Cold-finished carbon bars continue in easy supply. There is belief in the trade that granting of a wage increase to steelworkers would spur demand for tin plate in the fourth quarter before next year's tin plate contracts are signed.

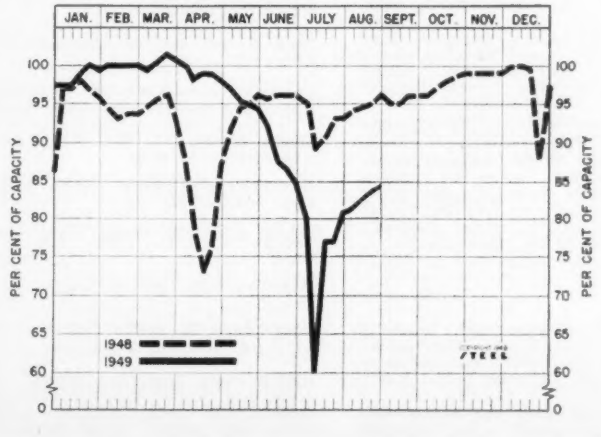
PRODUCTION—Reflecting increased demand, steelmaking operations rose another point last week and utilized 84.5 per cent of capacity. This is the highest rate attained since mid-June and is equivalent to 1,560,000 net tons of steel.

WAREHOUSES— Charge for delivery of steel from Chicago and Boston warehouses to consumers in those cities has gone up 5 cents per 100 pounds, making a new rate of 20 cents per hundred. Prevailing rate in the nation, except in New York city where the 20-cent rate was adopted a year ago, has been 15 cents. With consumers seeking to hold down production costs and showing considerable interest in secondary sheets, some distributors which have been dealing only in prime materials are considering adding a line of secondary.

PRICE COMPOSITES— Reflecting strength in practically all major districts, STEEL's price composite on steelmaking grades of scrap rose last week for the third consecutive week. The new level is $22.17, compared with $21.92 for the preceding week and $43.33 for the corresponding week last year. Composites on other classifications held unchanged last week. They and comparisons for the corresponding week of last year are: Finished steel, $91.55 and $95.05; semifinished steel, $63.22 and $75.75; and steelmaking pig iron, $45.60 and $44.32.

SCRAP—Higher operations at steel mills has contributed to a continued firming of scrap prices. Buying by mills continues light, however, as they are still relying extensively on inventories. The price firming has made it necessary for brokers in covering old orders to pay more than they received.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Aug. 27	Change	Same Week 1948	Same Week 1947
Pittsburgh	80.5	+ 1.5	94.5	96
Chicago	92	+ 2*	95	90.5
Eastern Pa.	77	+ 1.5	92	91
Youngstown	90	+ 2	103	92
Wheeling	94	+ 2.5	93	89
Cleveland	92.5	— 6.5*	97.5	94.5
Buffalo	98.5	— 2.5	101.5	88.5
Birmingham	100	None	100	99
New England	70	+ 8	80	89
Cincinnati	93	+ 6	106	87
St. Louis	87	None	85	82
Detroit	96	None	99	92
Western	83	+ 4	..	..
Estimated national rate	84.5	+ 1	96	93

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947. * From revised rate.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	Aug. 27	Aug. 20	Month Ago July 1949	Year Ago Aug. 1948	5 Years Ago Aug. 1944
Finished Steel	$91.55	$91.55	$91.82	$95.05	$56.73
Semifinished Steel	63.22	63.22	62.37	75.75	36.00
Steelmaking Pig Iron	46.60	46.60	45.60	44.12	23.00
Steelmaking Scrap	22.17	21.92	19.21	43.33	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

June 1949	4.01731c
May 1949	4.01731c
Apr. 1949	4.02031c
June 1948	3.57740c
June 1944	2.46683c

*** STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (rerolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

† FINISHED STEEL WEIGHTED COMPOSITE: Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. June, 1949, figure is preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

Finished Materials

	Aug. 27, 1949	July, 1949	May, 1949	Aug., 1948
Steel bars, Pittsburgh mills	3.35c	3.35c	3.35c	3.45c
Steel bars, del. Philadelphia	3.8164	3.8164	3.8164	3.79
Steel bars, Chicago mills	3.35	3.35	3.35	3.35
Shapes, Pittsburgh mills	3.25	3.25	3.25	3.275
Shapes, Chicago mills	3.25	3.25	3.25	3.25
Shapes, del. Philadelphia	3.4918	3.4918	3.4918	3.48
Plates, Pittsburgh mills	3.40	3.40	3.40	3.50
Plates, Chicago mills	3.40	3.40	3.40	3.40
Plates, del. Philadelphia	3.5848	3.5848	3.6348	3.71
Sheets, hot-rolled, Pittsburgh mills	3.25	3.25	3.25	3.275
Sheets, cold-rolled, Pittsburgh	4.00	4.00	4.00	4.00
Sheets, No. 10 galv., Pittsburgh	4.40	4.40	4.40	4.40
Sheets, hot-rolled, Gary mills	3.25	3.25	3.25	3.25
Sheets, cold-rolled, Gary mills	4.00	4.00	4.00	4.00
Sheets, No. 10 galv., Gary mills	4.40	4.40	4.40	4.40
Strip, hot-rolled, Pittsburgh mills	3.25	3.25	3.25	3.275
Strip, cold-rolled, Pittsburgh mills	4.00	4.275	4.375	4.375
Bright basic, wire, Pittsburgh	4.15	4.15	4.15	4.325
Wire nails, Pittsburgh mills	5.15	5.15	5.15	5.775
Tin plate, per base box, Pitts. dist.	$7.75†	$7.75†	$7.75†	$6.80

Semifinished

Sheet bars, mill	$60.00	$67.00*	$67.00*	$67.00*
Slabs, Chicago	52.00	52.00	52.00	52.00
Rerolling billets, Pittsburgh	52.00	52.00	52.00	59.00
Wire rod ⅜ to ¼-inch, Pitts. dist.	3.40c	3.40c	3.775c	3.775c

† 1.50 lb coating.
* Nominal.

Pig Iron

	Aug. 27, 1949	July, 1949	May, 1949	Aug., 1948
Bessemer, del. Pittsburgh (N.&S. sides)	$48.08	$48.08	$48.08	$48.08
Basic, Valley	46.00	46.00	46.00	43.00
Basic eastern, del. Philadelphia	49.39	49.39	49.39	46.17
No. 2 fdry., del. Pgh. (N.&S. sides)	47.58	47.58	47.58	47.58
No. 2 fdry., del. Philadelphia	49.89	49.89	49.89	46.67
No. 2 foundry, Chicago	46.50	46.31	46.25	43.25
No. 2 foundry, Valley	46.50	46.50	46.50	43.50
Southern No. 2 Birmingham	39.38	39.38	39.88	43.38
Southern No. 2 del. Cincinnati	45.43	45.43	49.43	49.09
Malleable, Valley	46.50	46.50	46.50	43.50
Malleable, Chicago	46.50	46.50	46.50	43.50
Charcoal, low phos., fob Lyles, Tenn.	66.00	66.00	66.00	62.00
Ferromanganese, f.o.b. Etna, Pa.	175.00	175.00	170.20	148.00

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$23.50	$21.00	$23.25	$42.75
Heavy melt. steel, No. 2 E. Pa.	19.00	16.125	19.56	41.50
Heavy melt. steel, No. 1, Chicago	22.50	19.50	21.50	31.75
Heavy melt. steel, No. 1 Valley	24.75	18.50	22.00	42.75
Heavy melt. steel, No. 1, Cleveland	20.00	15.00	18.50	42.25
Heavy melt. steel, No. 1, Buffalo	24.25	19.50	22.81	46.56
Rails for rerolling, Chicago	34.50	27.75	27.75	64.13
No. 1 cast, Chicago	39.00	29.00	27.50	70.75

Coke

Connellsville, beehive furnace	$13.25	$13.25	$14.25	$14.38
Connellsville, beehive foundry	15.75	15.75	16.75	17.00
Chicago, oven foundry, ovens	20.00	20.00	20.40	20.40

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, nominal. Forging quality, $50 per net ton, mill.

Alloy Steel Ingots: $51 per net ton, mill.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except: $57, Conshohocken, Pa.; $71, Fontana, Calif.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except: $63, Conshohocken, Pa.; $80, Fontana, Calif.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill except: $65 Conshohocken, Pa.; $82, Fontana, Calif.

Sheet Bars: $60 per gross ton, Mansfield, O.; $52 on open market.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill.

Wire Rods: Basic and acid open-hearth, 7/32 & ⅜-inch, inclusive, 3.40c per lb, mill, except: 3.70c, Worcester, Mass.; 4.05c, Pittsburg, Calif.; 4.10c, Los Angeles; 4.20c, Torrance, Calif. Basic open hearth and bessemer, 7/32 to 47/64-in., inclusive, 3.50c, Sparrows Point, Md.

Bars

Hot-Rolled Carbon Bars (O.H. only; base 20 tons): 3.35c, mill, except: 3.50c Atlanta; 3.55c, Ecorse, Mich.; 3.75c, Houston; 3.95c, Kansas City; 4.00c, Fontana, Calif.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif.; Portland, Oreg., Seattle; 4.10c, Minnequa, Colo.

Rail Steel Bars: (Base 10 tons): 3.35c Huntington, W. Va., Moline, Ill., Williamsport, Pa.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 4.75c, Fontana, Calif.

Cold-Finished Carbon Bars (Base 40,000 lb and over): 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.25c, Plymouth, Mich.; 4.40c, Newark, N. J.; Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.48c, Camden, N. J.; 5.40c, Los Angeles.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford, Conn.

High-Strength, Low-Alloy Bars: 5.10c, mill, except: 5.30c, Ecorse, Mich.

Reinforcing Bars (New Billet): 3.35c, mill, except: 3.50c, Atlanta; 4.00c, Fontana, Calif.; 3.75c, Houston; 3.95c, Kansas City; 4.05c, Los Angeles, Pittsburg, Torrance, Calif. 4.10c, Seattle, S. San Francisco, 4.25c, Minnequa, Colo. Fabricated: To consumers: 4.25c, mill, except: 5.00c, Seattle.

Reinforcing Bars (Rail Steel): 3.85c, Williamsport, Pa., mill; 3.35c, Huntington, W. Va.

Wrought Iron Bars: Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa.; 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

Sheets

Hot-Rolled Sheets (18-gage and heavier): 3.25c, mill, except: 3.45c, Ecorse, Mich.; 3.65c, Houston; 3.35c, Conshohocken, Pa., Kokomo, Ind.; 3.95c, Pittsburg, Torrance, Calif.; 4.15c, Fontana, Calif.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.40c, Alabama City, Ala.; 5.00c, Dover, O.; 5.05c, Torrance, Calif.; 4.25c, Kokomo, Ind.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Ecorse, Mich., Granite City, Ill.; 4.90c, Fontana, Calif.; 4.95c, Pittsburg, Calif.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill except: 4.50c, Kokomo, Ind.; 5.15c, Pittsburg, Torrance, Calif.; 5.40c, Dover, O.

Galvannealed Sheets: 4.95c, mill, except: 5.05c, Kokomo, Ind.

Culvert Sheets, No. 16 flat Copper Steel (based on 5-cent zinc): 5.00c, mill, except: 5.40c, Granite City, Ill., Kokomo, Ind.; 5.75c, Pittsburg, Torrance, Calif.

Long Ternes, No. 10 (Commercial quality): 4.80c, mill.

Enameling Sheets, No. 12: 4.40c mill, except: 4.60c Granite City, Ill.; 4.70c, Ecorse, Mich.

Silicon Sheets, No. 24: Field: 5.15c, mill. Armature: 5.45c, mill.

Electrical: Hot-rolled, 5.95c, mill, except: 6.15c, Granite City, Ill.

Motor: 6.70c mill, except: 6.90c, Granite City, Ill.

Dynamo: 7.50, mill, except: 7.70c, Granite City, Ill.

Transformer 72, 8.05c, mill; 65, 8.60c, mill, 58, 9.30c, mill, 52, 10.10c, mill.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c, mill, except: 5.15c, Ecorse, Mich. Galvanized (No. 10), 6.75c, mill. Cold-rolled, 6.05c, mill, except: 6.25c, Ecorse, Mich.

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Strip

Hot-Rolled Strip: 3.25c mill, except: 3.40c, Atlanta; 3.45c, Detroit, Ecorse, Mich.;3.65c, Houston; 3.85c, Kansas City, Mo.; 4.00c, Los Angeles, S. San Francisco, Pittsburg, Torrance, Calif.; 4.25c, Seattle, 4.30c, Minnequa, Colo.; 4.10c, Fontana, Calif. One company quotes 4.90c, Pittsburgh base.

Cold-Rolled Strip: (0.25 carbon and less): 4.00c, mill, except: 4.15c, Riverdale, Ill.; 4.20c, Ecorse, Mich.; 4.20-4.25c, Detroit; 4.50c, New Haven and Wallingford, Conn., Boston; 4.50-5.00c, Trenton, N. J.; 4.90c, Fontana, Calif., 5.75c, Los Angeles; 6.10c, Berea, O. One company quotes 4.50c, Pittsburgh base; another, 4.55c, Cleveland or Pittsburgh base, and 4.75c, Worcester, Mass., base.

Cold-Finished Spring Steel: 0.26-0.40 C, 4.00c, mill, except: 4.25c, Chicago; 4.30c, Worcester, Mass.; 4.50c, Boston, Youngstown, Wallingford, Conn.

Over 0.40 to 0.60 C, 5.50c, mill except: 5.65c, Chicago; 5.80c, Worcester, Mass., Wallingford, Conn., Trenton, N. J.; 5.95c, Boston. Over 0.60 to 0.80 C, 6.10c, mill, except: 6.25c, Chicago; 6.40c, Worcester, Mass., Wallingford, Bristol, Conn., Trenton and Harrison, N. J.

Over 0.80 to 1.05 C, 8.05c, mill, except: 7.85c, Dover, O.; 8.20c, Chicago; 8.35c, Worcester, Mass., Bristol, Conn., Trenton and Harrison, N. J.

Over 1.05 to 1.35 C, 10.35c, mill, except: 10.15c, Dover, O.; 10.50c, Chicago; 10.65c, Worcester, Mass., Trenton and Harrison, N. J.

Cold-Rolled Alloy Strip: 9.50c, mill except: 9.80c, Worcester, Mass., Harrison, N. J.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.15c, Ecorse, Mich. Cold-rolled, 6.05c, mill, except: 6.25c, Ecorse, Mich.

Tin, Terne, Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $7.50-$7.70; 1.50 lb coating $7.75-$7.95. Pittsburg, Calif., mill $8.25 and $8.50, respectively, for 1.25 and 1.50 lb coatings.

Electrolytic Tin Plate: Per base box of 100 lb. 0.25 lb tin, $6.45-$6.65; 0.50 lb tin, $6.70-$6.90; 0.75 lb tin, $7.00-$7.20.

Can Making Black Plate: Per base box of 100 lb, 55 to 128 lb basis weight $5.75-$5.85. Pittsburg, Calif., mill, $6.50.

Holloware Enameling Black Plate: 29-gage, 5.30c per pound, except: 5.50c, Granite City, Ill.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, $6.65, except: $6.75 Fairfield, Ala.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb, $17.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.50c, Coatesville, Pa., Claymont, Del., Conshohocken, Pa., Harrisburg, Pa.; 3.65c, Ecorse, Mich.; 3.80c, Houston; 4.00c, Fontana, Calif.; 4.30c, Seattle, Minnequa, Colo.; 6.25c, Kansas City, Mo.

Floor Plates: 4.55c, mill.

Open-Hearth Alloy Plates: 4.40c, mill, except: 4.50c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.40c, Ecorse, Mich.

Shapes

Structural Shapes: 3.25c, mill, except: 3.30c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 3.65c, Houston; 3.80c, S. San Francisco, Fontana, Calif.; 3.85c, Kansas City, Mo., Los Angeles, Torrance, Calif.; 3.90c, Seattle; 3.75c, Minnequa, Colo.

Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Palmer, Mass.; 4.50c, Minnequa, Colo., Atlanta; 4.75c, Kansas City, Mo.; 5.10c, Pittsburg, Calif.; 5.10c, S. San Francisco. One producer quotes 4.15c, Chicago base; another 4.30c, Crawfordsville, Ind., freight equalized with Pittsburgh, Birmingham, Chicago, Houston.

Basic MR Spring Wire, 5.55c, mill, except: 5.65c, Sparrows Point, Md.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J.; 6.50c, Los Angeles, Pittsburg, Calif.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., 5.50c Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Los Angeles, Pittsburg, Calif.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill except: 4.90c, Sparrows Point, Md., Kokomo, Ind.; 4.95c, Atlanta; 5.10c Worcester, Mass.; 5.15c, Minnequa, Colo.; 5.75c, S. San Francisco, Los Angeles, Pittsburg, Calif. One producer quotes 4.80c, Chicago and Pittsburgh base; another, 4.95c, Crawfordsville, Ind., freight equalized with Pittsburgh, Birmingham, Chicago and Houston.

Galvanized (6 to 8 Gage base): 5.25c, mill, except: 5.35c, Sparrows Point, Md., Kokomo, Ind.; 5.40c, Atlanta; 5.55c, Worcester, Mass.; 5.60c, Minnequa, Colo.; 6.20c, Pittsburg, S. San Francisco, Calif. One producer quotes 5.25c, Pittsburgh and Chicago base; another, 5.40c, Crawfordsville, Ind., freight equalized with Birmingham, Pittsburgh, Chicago, Houston.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Col. 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind., Atlanta; 109, Worcester, Mass.; 110, Minnequa, Colo., Cleveland; 122, Pittsburg, Calif., 123, Torrance, Calif. One producer quotes Col. 103, Chicago and Pittsburgh base; another, Col. 106, Crawfordsville, Ind., freight equalized with Birmingham, Pittsburgh, Chicago, Houston.

Woven Fence (9 to 15½ Gage, inclusive): Col. 109, mill, except: 111, Kokomo, Ind., Atlanta; 116, Minnequa, Colo.; 132, Pittsburg, Calif. One producer quotes Col. 109, Pittsburgh and Chicago base; another, Col. 112, Crawfordsville, Ind., freight equalized with Pittsburgh, Birmingham, Chicago, Houston.

Barbed Wire: Col. 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind., Atlanta; 130, Minnequa, Colo.; 143, Pittsburg, Calif.; 143 S. San Francisco. One producer quotes Col. 123, Chicago and Pittsburgh base; another, Col. 126, Crawfordsville, Ind., freight equalized with Birmingham, Pittsburgh, Chicago, Houston.

Fence Posts (with clamps): Col. 112, Duluth, Jolliet, Ill.; Johnstown, Pa.; 116, Moline, Ill.; 122, Minnequa, Colo.; $120 per net ton, Williamsport, Pa.

Bale Ties (single loop): Col. 106, mill, except: 107, Atlanta; 108, Sparrows Point, Md., Kokomo, Ind.; 113, Minnequa, Colo.; 130, S. San Francisco, Pittsburg, Calif. One producer quotes Col. 109, Crawfordsville, Ind., freight equalized with Birmingham, Pittsburgh, Chicago and Houston.

Stainless Steels

(Mill prices, cents per pound)

CHROMIUM NICKEL STEELS

Type No.	Bars, Wire Shapes	Strip, Cold-Rolled	Sheets
301	28.50	30.50	37.50
302	28.50	33.00	37.50
303	31.00	36.50	39.50
304	30.00	35.00	39.50
316	46.00	55.00	53.00
321	34.00	44.50	45.50
347	38.50	48.50	50.00

STRAIGHT CHROMIUM STEELS

410	23.00	27.00	33.00
416	23.50	33.50	33.50
420	28.50	43.50	40.50
430	23.50	27.50	35.50
442	27.00	39.00	39.50
446	32.50	60.00	50.00

STAINLESS-CLAD STEELS

	Plates —Cladding—		Sheets —Cladding—	
	10%	20%	10%	20%
302	....	....	19.75	21.50
304	22.50	26.50	20.75	22.50
310	32.50	36.50	....	....
316	27.00	31.00	26.00	28.00
321	23.50	27.50	....	....
347	25.00	29.00	24.00	26.00
405	18.75	24.75	....	....
410	18.25	24.25	....	....
430	18.25	24.25	....	....

Tool Steels

Tool Steel: Cents per pound, producing plants; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work, 29.00c.

W	Cr	V	Mo	Co	Base Per lb
18	4	1	...	...	90.50c
18	4	2	...	...	102.50c
18	4	3	...	...	114.50c
18	4	2	...	9	168.50c
1.5	4	1	8.5	...	65.00c
6.4	4.5	1.9	5	...	69.50c
6	4	3	6	...	88.00c

Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	35 off
⅝ and ⅝ x 6 in. and shorter	37 off
¾-in. and larger x 6-in. and shorter	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	35 off

Stove Bolts

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
⅞-in. and smaller	41 off	.....
½-in. and smaller	.....	38 off
⅛-in.-1-in.	39 off	....
⅛-in.-1-in.	.....	37 off
1⅛-in.-1½-in.	37 off	35 off
1⅝-in. and larger	34 off	28 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter	40 off

Square Head Set Screws

Upset 1-in. and smaller	51 off
¾, ⅞, & 1 x 6-in. and shorter	35 off
Headless, ¼-in. and larger	31 off

Rivets

F.o.b. midwestern plants

Structural ½-in. and larger	6.75c
⅞-in. and under	48 off

Washers, Wrought

F.o.b. shipping point, to jobbers..Net to $1 off

Tubular Goods

Standard Steel Pipe: Eastern mill carlot prices, threaded and coupled, to consumers about $200 a net ton. Discounts from base:

Butt Weld

In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	39½-	11-	1	46½-	30½-
	41½	13½		48½	33½
¼	37½-	13-	1¼	47-	31-
	39½	15½		49	34
⅜	34-	9½-	1½	47½-	31½-
	36	12½		49½	34½
½	41-	23½-	2	48-	32-
	43	26½		50	35
¾	44-	27½-	2½, 3	48½-	32½-
	46	30½		50½	35½
			3½ & 4	44½	29

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	40½	25	38½	23	28-	12½-
					38½	23
2½	44½	29	41½	26	33½-	18-
					41½	26
3	44½	29	41½	26	36-	20½
					41½	26
3½&4	42½-	26-	43½	28	38½-	23-
	46½	31			43½	28
5 & 6	42½-	26-	43½	28	43½	28
	44½	29				
7	....	....	....	....	43½	27

Pipe Cast Iron: Class B, 6-in. and over, $82.50-$93.50 per net ton, Birmingham; $87.50, Burlington, N. J.; 4-in. pipe, $5 higher; Class A pipe, $5 a ton over Class B.

For prices on line and standard wrought iron pipe and boiler tubes, please refer to Aug. 8 issue, page 123.

Rails, Supplies

Rails: Standard, over 60-lb; $3.20 per 100 lb mill.

Light (billet): $3.55 per 100 lb, mill, except: $4.25, Minnequa, Colo.

Light (rail steel): $3.55 per 100 lb, Williamsport, Pa., Huntington, W. Va.

Railroad Supplies: Track bolts, treated: $8.50 per 100 lb, mill. Untreated: $8.25, mill.

Tie Plates: 4.05c mill, except: 4.20c, Pittsburg, Torrance, Calif.; 4.50c, Seattle.

Splice Bars: 4.25c, mill.

Standard Spikes: 5.35c, mill.

Axles: 5.20c, mill.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$48.00	$48.50	$49.00	$49.50
Newark, N. J., del.	50.5334	51.0334	51.5334	52.0334
Brooklyn, N. Y., del.	....	52.634	53.134	....
Birmingham, furnace	38.88	39.38	....	....
Cincinnati, del.	....	45.43	....	....
Buffalo, furnace	46.00	46.50	47.00	....
Boston, del.	54.92	55.42	55.92	....
Rochester, del.	47.95	48.45	48.95	....
Syracuse, del.	49.39	49.89	50.39	....
§**Chicago,** district furnaces	46.00	46.50	46.50	47.00
Milwaukee, del.	47.82	48.32	48.32	48.82
Muskegon, Mich., del.	....	51.78	51.78	....
Cleveland, furnace	46.00	46.50	46.50	47.00
Akron, del.	48.3002	48.8002	48.8002	49.3002
Duluth, furnace	....	....	46.50	....
Erie, Pa., furnace	46.00	46.50	46.50	47.00
Everett, Mass., furnace	....	50.00	50.50	....
Geneva, Utah, furnace	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.0578	....	....
Portland, Oreg., del.	....	54.0578	....	....
Los Angeles, San Francisco	53.5578	54.0578	....	....
Granite City, Ill., furnace	47.90	48.40	48.90	....
St. Louis, del.	48.65*	49.15*	49.65*	....
Ironton, Utah, furnace	46.00	46.50	....	....
Lone Star, Tex., furnace	46.00	†46.50	....	....
Gulf ports, del.	50.50	51.00	....	....
Lorain, O., furnace	46.00	....	....	47.00
Minnequa, Colo., furnace	47.00	47.50	47.50	....
‡**Neville Island, Pa.,** furnace	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	46.00	....	46.50	47.00
Sharpsville, Pa., furnace	46.00	46.50	46.50	47.00
Steelton, Pa., furnace	48.00	48.50	49.00	49.50
Steubenville, O., furnace	46.00	....	....	47.00
Struthers, O., furnace	46.00	....	....	....
Swedeland, Pa., furnace	48.00	48.50	49.00	49.50
Philadelphia, del.	49.39	49.89	50.39	50.89
Toledo, O., furnace	46.00	46.50	46.50	47.00
Cincinnati, del.	50.8230	51.3230	....	....
Troy, N. Y., furnace	48.00	48.50	49.00	....
Youngstown, O., furnace	46.00	46.50	46.50	47.00
Mansfield, O., del.	50.1022	50.6022	50.6022	51.1022

* Including 3 per cent federal transportation tax.
† Low phosphorus southern grade.
‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaca; $1.73 Verona; $1.94 Brackenridge; $1.08 for Ambridge and Aliquippa.
§ Includes Chicago, S. Chicago, Ill., Gary, Indiana Harbor, Ind.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base)	$59.50		
6.51-7.00	60.50	9.01- 9.50	65.50
7.01-7.50	61.50	9.51-10.00	66.50
7.51-8.00	62.50	10.01-10.50	67.50
8.01-8.50	63.50	10.51-11.00	68.50
8.51-9.00	64.50	11.01-11.50	69.50

F.o.b. Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $71.50 furnace, Niagara Falls; $77 open-hearth and foundry grades, Keokuk, Iowa, or Wenatchee, Wash., freight allowed to normal trade area; 12½ lb piglets, $82, Keokuk, Iowa, freight allowed to normal trade area. Add $1 a ton for each additional 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 a ton for 0.045% max. P.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. F.o.b. furnace, Lyles, Tenn.....$66 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., Troy, N. Y., $54; Philadelphia, $56.9786 del. Intermediate phosphorus, Central Furnaces, Cleveland, $51.

Electrodes

(Threaded, with nipples, unboxed)

Diam. (Inches)	Length	Cents per lb, f.o.b. plant
Graphite		
17, 18, 20	60, 72	16.00
8 to 16	48, 60, 72	16.50
7	48, 60	17.75
6	48, 60	19.00
4, 5⅛	40	19.50
3	40	20.50
2½	24, 30	21.00
2	24, 30	23.00
Carbon		
40	100, 110	7.50
35	100, 110	7.50
30	84, 110	7.50
24	72 to 104	7.50
17 to 20	84, 90	7.50
14	60, 72	8.00
10, 12	60	8.25
8	60	8.50

Fluorspar

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Metallurgical Coke

Price per Net Ton

Beehive Ovens	
Connellsville, furnace	$13.00-13.50
Connellsville, foundry	15.50-16.00
New River, foundry	18.00
Wise county, foundry	15.35
Wise county, furnace	14.60
Oven Foundry Coke	
Kearney, N. J., ovens	$22.00
Everett, Mass., ovens, New England, del.‡	22.70
Chicago, ovens	20.00
Chicago, del.	†21.45
Detroit, del.	23.76
Terre Haute, ovens	20.20
Milwaukee, ovens	20.75
Indianapolis, ovens	19.85
Chicago, del.	23.19
Cincinnati, del	22.66
Detroit, del.	23.61
Ironton, O., ovens	19.40
Cincinnati, del.	21.63
Painesville, O., ovens	20.90
Buffalo, del.	23.42
Cleveland, del.	22.55
Erie, del.	22.70
Birmingham, ovens	17.70
Philadelphia, ovens	20.45
Swedeland, Pa., ovens	20.40
Portsmouth, O., ovens	19.50
Detroit, ovens	20.65
Detroit, del.	*21.70
Buffalo, del	22.95
Flint, del.	23.00
Pontiac, del.	21.98
Saginaw, del.	23.30

Includes representative switching charge of: *, $1.05; †, $1.45. ‡ Or within $4.03 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens (Price effective as of Aug. 5)

Pure benzol	20.00
Toluol, one degree	19.00-23.50
Industrial xylol	20.50-26.50
Per ton bulk, ovens	
Sulphate of ammonia	$45.00
Per pound, ovens (Effective June 1, 1949)	
Phenol, 40 (carlots, returnable drums)	13.25
Do., less than carlots	14.00
Do., tank cars	12.50
(Effective Oct. 25, 1948)	
Naphthalene flakes, balls, bbl to jobbers, "household use"	13.75

Refractories

(Prices per 1000 brick, f.o.b. plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $100. Hard-fired, $135 at above points.

High-heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., Ottawa, Ill., $66.

Ladle Brick

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa., Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., $90; Beach Creek, Pa., $80.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; Chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ⅜" grains; Bulk, $30.50-31.00; single paper bags, $35.00-35.50.

Dolomite

(Base prices per net ton)

Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural) Lower Lake Ports

(Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon effective after Dec. 31, 1948, are for buyer's account.)

Old range bessemer	$7.60
Old range nonbessemer	7.45
Mesabi bessemer	7.35
Mesabi nonbessemer	7.20
High phosphorus	7.20

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.62% concentrates, contract	16.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%: Spot	17.00
Long-term contract	15.00
Brazil iron ore, 68-69%	19.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26-$28

Manganese Ore

Long term contracts, involving large tonnages, prices are nominal; nearby, 48%, duty paid, 81.8c-83.8c per long ton unit, c.i.f. United States ports; prices on lower grades adjusted to manganese content and impurities.

Chrome Ore

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50
Brazilian—nominal	
44% 2.5:1 lump	$33.65
Rhodesian	
45% no ratio	$27-27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb, Mo., cont., Mines	$0.90

WAREHOUSE STEEL PRICES

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga. and Heavier*	C.R. 15 Ga.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	5.60	6.51	7.10	5.82	...	5.77	6.31	8.28	5.53	5.85	7.36
New York(c'try)	5.40	6.31	6.90	5.62	...	5.57	6.11	8.08	5.33	5.65	7.16
Boston (city) ..	5.75	6.75**	7.16	5.80	...	5.72	6.22	8.77	5.62	5.95	7.45
Boston (c'try) .	5.55	6.55**	6.96	5.60	...	5.52	6.02	8.57	5.42	5.75	7.25
Phila. (city)...	5.80	6.39	6.78	5.55	...	5.55	6.09	8.00	5.25	5.50	6.70
Phila. (c'try) ..	5.65	6.24	6.63	5.40	...	5.40	5.94	7.85	5.10	5.35	6.55
Balt. (city)....	5.46	6.36	6.81	5.52	...	5.57	6.31	...	5.51	5.71	7.16
Balt. (c'try)...	5.31	6.21	6.66	5.37	...	5.42	6.16	...	5.36	5.56	7.01
Norfolk, Va. ..	5.80‡	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse).	6.07‡	...	...	5.83	...	5.88	6.62	...	5.82	6.02	7.47
Buffalo (del.)..	5.00‡	5.90	7.57	5.39	6.42	5.10	5.60	10.13	5.15	5.50	7.06
Buffalo (w'hse)	4.85‡	5.75	7.42	5.24	6.27	4.95	5.40	9.60	5.00	5.35	6.91
Pitts. (w'hse)..	4.85	5.75[4]*	6.80	5.00	6.00	4.90	5.40	9.20††	4.90	5.05	6.55
Detroit (w'hse)	5.32	6.22[4]*	7.35	5.42	6.42-6.73	5.48	5.90	8.44-8.59	5.48	5.67	7.02
Cleveland (del.)	5.00	5.90	6.70	5.15-5.18	6.15	5.15-5.16	5.60	7.84-8.00	5.15-5.16	5.35-5.36	6.80-6.81
Cleve. (w'hse).	4.85	5.75	6.55	5.00-5.03	6.00	5.00-5.01	5.45	7.84-7.85	5.00-5.01	5.20-5.21	6.65-6.66
Cincin. (w'hse).	5.26‡	5.94**	6.83	5.38	6.10	5.43	5.94	...	5.43	5.63	7.03
Chicago (city) .	5.05	5.95[4]	7.05	5.05	6.35-6.85	5.10	5.60	7.90[5]	5.10	5.30	6.75
Chicago (w'hse	4.85	5.75[4]	6.85	4.85	6.15-6.65	4.90	5.40	7.70[5]	4.90	5.10	6.55
Milwaukee(city)	5.18	6.08[4]	7.18	5.18	6.98	5.23	5.78	8.03[5]	5.23	5.43	6.88
St. Louis (del.)	5.37	6.27[4]	7.44	5.34	6.64	5.39	6.19[6]	6.64	5.39	5.59	7.04
St. L. (w'hse) .	5.22	6.12[4]	7.29	5.19	6.49	5.24	6.04[6]	6.49	5.24	5.44	6.89
Birm'ham (city)	5.00	5.90	6.55	5.00	...	5.00	6.83	...	5.05	5.25	7.69
Birm'ham(c'try)	4.85	5.75	6.40	4.85	...	4.85	6.68	...	4.90	5.10	7.54
Omaha, Nebr...	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Los Ang. (city)	6.60	8.05**	7.60	6.80	7.75	6.25	8.20	...	6.10	6.30	8.20
L. A. (w'hse)..	6.45	7.90**	7.45	6.65	7.60	6.10	8.05	...	5.95	6.15	8.05
San Francisco..	6.15[10]	7.50[3]	8.10	6.75[10]	8.25[8]	5.90[10]	7.55	10.85[2]	5.90	6.35	8.10
Seattle-Tacoma .	6.70[7]‡	8.15[3]	8.80	6.70[7]	...	6.20[7]	8.15[1]	10.35	6.00[7]	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ as rolled; ** 17 gage; †† as annealed.

Base quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 1000 lb and over; galvanized sheets, 450 lb to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 1499 lb; [4]—400 to 1499 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—300 to 9999 lb; [8]—1500 to 1999 lb; [9]—400 to 3999 lb; [10]—400 lb and over; [11]—500 to 1499 lb.

PRICES OF LEADING FERROALLOY PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., SMxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si; packed 19.90-21.70c; ton lot 21.00-22.60c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l., lump, bulk, regular 19.0c per lb of Si c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.40c per lb of alloy, ton lots packed 8.80c, 200 to 1999 lb 9.15c, smaller lots 9.65c. Delivered. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

(Please turn to Page 126)

Strikes Cutting Metal Supply

Several producing properties are already closed by labor difficulties while strike votes are being taken at other properties. Silver prices advance 1-cent an ounce

New York—Business outlook in the nonferrous metal markets is clouded by labor developments. The Bunker Hill & Sullivan Mining & Concentrating Co.'s lead smelter at Kellogg, Idaho, is closed by a strike for health and welfare benefits. A strike at the refinery of the American Metal Co. is creating a tight situation in some copper shapes and is attributed to the drop in silver supplies and an accompanying price advance of one cent an ounce in that metal. A strike vote at smelters and refineries of Phelps Dodge Corp., was taken last week. Another vote has been announced by CIO officials at the El Paso smelter of American Smelting & Refining Co.

Prolonged strikes at metal producing properties would have almost an immediate effect on prices since production at current rates is necessary to maintain the close balance between supply and demand.

Copper—Hope for a minimum of labor disturbance in the metal producing and fabricating fields was strengthened by the settlement of the strike at Bristol Brass Corp., Bristol, Conn. This strike had been in progress since July 26. Workers at the Fairmont City, Ill., plant of American Zinc, Lead & Smelting Co. have voted to have the International Union of Mine, Mill & Smelter Workers-CIO for its bargaining agent.

At the end of July, copper and brass mills reported a deficit of 111,752 tons of copper, 21,444 tons greater than the June 30 deficit. Fabricators had unfilled orders as of July 31 totaling 206,056 tons while their total stocks and purchases amounted to only 94,304 tons. Their stocks of refined metal totaled 325,806 tons, of which 278,242 tons are classified as "working stocks." Visible supplies totaled 47,564 tons while undelivered purchases amounted to 46,740 tons. Actual consumption of copper during July amounted to 60,823 tons, or a decrease of 10,301 tons from the preceding month.

Due to the small flow of red metal scrap, refiners have raised their offering prices for the principal red metal grades. Small tonnages of No. 1 material have changed hands at 14.50c with other sales made at 14.25c.

Reflecting the keen competition in the wire market, one of the leading drawers has reduced prices for bare copper wire 1 cent a pound to the basis of 23.05c for less than carlots; for weatherproof wire, ½-cent a pound to 25.443c. Other sellers took similar action. Extras on bare wire are slightly higher. No change was made in extras covering wires ranging from 0000 up to No. 16 B & S gage. For the finer wires ranging from No. 17 gage upward, the extras are 1 cent a pound higher, while the extra for copper trolley wire is ¼-cent higher.

Lead—Substantial tonnages of lead are being booked here, although demand is not quite so pressing as it was earlier in the month. Including tonnages earmarked for the government stockpile, deliveries in August will show a sharp gain over those reported for July. Purchases for the stockpile are estimated at 60,000 tons for the third quarter and are expected to total around 40,000 in the fourth quarter.

Shipments of refined lead to domestic consumers during July increased to 34,894 tons from 30,017 tons in June and 19,792 tons in May, according to the American Bureau of Metal Statistics. July shipments included 6755 tons to battery makers and 2315 tons to cable makers. The report is not complete, however, since figures from one secondary plant closed by a strike are not available.

Production of refined lead dropped to 39,282 tons in July from 46,429 tons in June. Stocks of lead at refineries totaled 94,201 tons as of July 31.

Zinc—An official of the Bunker Hill lead smelter is reported to have stated that if the smelter is down for any great length of time, operations at the mines probably will come to a halt. This in turn probably would result in closing down the company's electrolytic refinery located at Silver King, Idaho, which produced about 42,000 tons of electrolytic zinc in 1948.

Prospects of a possible curtailment in supplies has not stimulated buying interest among principal consumers, although a satisfactory volume is being booked on the basis of 10.00c, St. Louis, for prime western.

Tin—World mine production of tin concentrates is estimated by the statistical office of the International Tin Study Group at 15,600 tons, an increase of 2800 tons over the May total. The increase was attributed mainly to a rise in Bolivian exports to 4001 tons from 2333 tons in June and to a gain of 602 tons in Malayan production to 4802 tons. Estimated production of 15,600 tons in June establishes a new postwar high. Smelter production of tin metal in June is estimated at 14,000 tons.

Silver—Supplies of silver tightened last week as fabricators are buying larger amounts than have been reported in some time. This has resulted in advances of ½-cent on Aug. 23 and Aug. 24 to the basis of 72.50c, New York. These were the first revisions in prices since Feb. 15, 1949.

Reports on Magnesium Alloys

Washington—A comprehensive survey of the mechanical properties of some 200 alloys in forty magnesium alloy systems reveals that, of those systems studied, magnesium-zinc-silver-manganese-calcium is the most promising combination for further study and development, according to a report now available from the Office of Technical Services of the U. S. Department of Commerce.

The study, undertaken by Rensselaer Polytechnic Institute for the Air Force, disproved certain favorable assumptions which had been made regarding the high mechanical strength and good workability of the German Giesche alloy. It also found that the addition of 5 per cent each of the intermetallic compounds $Cd_{21}Ni_5$, Cd_3Cu, and Cd_3Sb_2 failed to improve the mechanical properties of magnesium and magnesium-zinc base compositions.

Preliminary investigation of warm rolling procedures for dilute magnesium-base alloys indicated the possibility of increased ductility and toughness with moderate strength properties through these methods, although the data were too limited in scope to draw specific conclusions.

Further study of the magnesium-zinc-aluminum-tin system agreed with earlier results indicating that magnesium-5 zinc-3 aluminum-3 tin was the best combination of this particular system.

The promising magnesium-5 zinc-1 silver-.5 magnesium-0.3 calcium alloy still has the drawbacks of hot-shortness and extreme sensitivity of its mechanical properties to small variations in composition and handling procedures, according to the report.

Further investigations are recommended for the purpose of overcoming these deficiencies.

PB 97657, *New Magnesium Alloys*, 243 pages including photographs, tables and bibliography, sells for $31.25 in photostat, $9 in microfilm. Orders should be addressed to the Library of Congress, Photoduplication Service, Publication Board Project, Washington 25, accompanied by check or money order payable to the Librarian of Congress.

Orders Corn Storage Bins

Los Angeles—Contract for fabrication of 10 aluminum bins for corn storage has been awarded by the Commodity Credit Corp. to Continental Steel Buildings, this city. Bins will have a total capacity of 610,000 bushels, and will be used to store corn acquired under the price-support program.

Seeks Bids on Sheets, Nails

Washington—United States firms have been invited by the minister of finance of Ecuador to submit quotations on 2000 tons of aluminum corrugated roofing sheets and 75 tons of wire nails, the Office of International Trade, reports.

The government of Ecuador is inviting quotations for these building materials for use in repairing damage caused by the recent earthquakes in that country.

Prices should be submitted on an f.a.s. basis directly to the Ministro De Hacienda, Quito, Ecuador.

Specifications of the commodities are: 2000 tons corrugated roofing sheets, aluminum, of thickness either 0.019 or 0.024 inches, in lengths of 6, 8, 10 or 12 feet, packed either in 500-lb or 2000-lb bundles, eight or ten 3-inch corrugations per sheet; and 75 tons of wire nails, common, assorted sizes.

Exporters may secure further information on the invitation for quotations from the Metals and Minerals Branch, Office of International Trade, U. S. Department of Commerce, Washington 25.

UNIVERSITY OF MICHIGAN LIBRARIES

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic 17.62½c, Conn. Valley, Lake, 17.75c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 15.00-16.00c; 88-10-2 (No. 215) 24.00c; 80-10-10 (No. 305) 20.50c; No. 1 yellow (No. 405) 12.75-13.75c.

Zinc: Prime western 10.00c, brass special 10.25c, intermediate 10.50c, East St. Louis; high grade 11.00c, delivered.

Lead: Common 14.92½c; chemical 15.02½c; corroding 15.02½c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloys 16.00-16.50c; No. 12 foundry alloy (No. 2 grade) 15.25-15.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 17.25c; grade 2, 16.25c; grade 3, 15.25c; grade 4, 14.25c. Prices include freight at carload rate up to 75 cents per 100 lb.
5% titanium-aluminum alloy No. 1 (low Cu) 31.00c; No. 2 (2% Cu) 28.00c, f.o.b. Eddystone, Pa.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $75-$78 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.15.

Cobalt: 97-98%, $1.80 per lb for 550 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.
Silver: Open market, New York, 72.50c per ounce.
Platinum: $69-$72 per ounce.
Palladium, $24 per troy ounce.
Iridium: $100-$110 per troy ounce.
Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 16-cent copper.)

Sheet: Copper 31.30; yellow brass 28.19; commercial bronze, 95%, 31.28; 90%, 30.84; red brass, 85%, 29.89; 80%, 29.47; best quality, 29.01; nickel silver, 18%, 41.78; phosphor-bronze, grade A, 5%, 50.47.
Rods: Copper, hot rolled 27.15; cold drawn 28.40; yellow brass free cutting, 22.76; commercial bronze, 95% 30.97; 90% 30.53; red brass 85% 29.58; 80% 29.16.
Seamless Tubing: Copper 31.34, yellow brass 31.20; commercial bronze 90% 33.50; red brass 85% 32.80; 80% 32.38.
Wire: Yellow brass 28.48; commercial bronze, 95% 31.57; 90% 31.13; red brass, 85% 30.18; 80% 29.76; best quality brass 29.30.
Copper Wire: Bare soft, f.o.b., eastern mills, 100,000 lb lots 22.42½, l.c.l. 23.05, c.l. 22.55; weatherproof, f.o.b. eastern mills, 100,000 lb lots 24.693, l.c.l. 25.443, c.l. 24.943; magnet, delivered, c.l. 27.62½, 15,000 lb or more 27.87½, l.c.l. 28.37½.

ALUMINUM

Sheets and Circles: 2s and 3S mill finish c.l

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12.24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	——Hexagonal—— R317-T4	17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $20.12½ per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $20.12½ per cwt. Traps and Bends: List price plus 55%.

ZINC

Sheets, 14.50c f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 14.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 13.00c; over 12-in., 14.00c.

NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00; 100 lb to 4000 lb, 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 25.50c; 5 tons and over 26.00c; 1 to 5 tons, 26.50c; less than 1 ton, 27.00c.

Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 27.96c; oval 27.46c; cast 25.99c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,000 lb, 17.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.25c; over 250 lb, 24.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Clevland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 2090 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25; less than 200 lb, 123.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c, f.o.b. Sewaren, N. J. On 100 or 350 lb drums only, 100 to 600 lb, 63.3c; 700 to 1900 lb, 60.9c; 2000 to 9900 lb, 59.1c; 10,000 lb and over, 58.00c, f.o.b. Carteret, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 40.50c, f.o.b. Cleveland; 39.25c, Detroit; 39.25c, Philadelphia.

Stannous Sulphate: Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 88.00c; 100 lb kegs, 89.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	14.62½	14.62½	13.87½
Yellow brass	12.00	11.75	11.00
Commercial Bronze			
95%	13.62½	13.37½	12.87½
90%	13.50	13.25	12.75
Red Brass			
85%	13.25	13.00	13.12½
80%	13.00	12.75	12.25
Best Quality (71-80%)	12.87½	12.62½	12.12½
Muntz Metal	11.12½	10.87½	10.37½
Nickel, silver, 10%	14.00	13.75	7.00
Phos. bronze, A	16.37½	16.12½	15.12½
Naval brass	11.62½	11.37½	10.87½
Manganese bronze	11.62½	11.37½	10.75

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 13.75-14.00; No. 2 copper 12.75-13.00; light copper 11.75-12.00; composition red brass 11.00-11.25; radiators 9.25; heavy yellow brass 8.50.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 14.25-14.50; No. 2 copper 13.25-13.50; light copper 12.25-12.50; refinery brass (60% copper) per dry copper content 12.00-12.25.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and Brass: Heavy copper and wire No. 1 12.50-12.75, No. 2 11.50-11.75, light copper 10.50-10.75, No. 1 composition red brass 9.25-9.50, No. 1 composition turnings 8.75-9.00, mixed brass turnings 5.50-5.75, new brass clippings 10.00-10.50, No. 1 brass rod turnings 7.50-7.75, light brass 5.50-5.75, heavy yellow brass 6.00-6.25, new brass rods ends 7.50-7.75, auto radiators, unsweated 7.50-7.75, cocks and faucets, 7.25-7.50, brass pipe 7.75-8.00.
Lead: Heavy 11.25-11.75, battery plates 7.00-7.25, linotype and stereotype 11.75-12.00, electrotype 10.50-11.00, mixed babbitt 11-75-12.00, solder joints, 14.50-15.00.
Zinc: Old zinc 4.00-4.50, new die cast scrap 3.50-4.00, old die cast scrap 2.50.
Tin: No. 1 pewter 52.00-54.00, block tin pipe 70.00-72.00, No. 1 babbitt 40.00-42.00.
Aluminum: Clippings 2S 10.00-10.50, old sheets 6.75-7.00, crankcase 6.75-7.00, borings and turnings 3.00-3.50.

DAILY PRICE RECORD

1949	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
July Avg.	17.279	13.335	9.346	103.000	17.000	38.500	40.000	71.500
June Avg.	16.606	11.850	9.548	103.000	17.000	38.500	40.000	71.500
May Avg.	18.045	13.566	11.880	103.000	17.000	38.500	40.000	71.500
Aug. 1	17.62½	14.30–14.35	10.00	103.00	17.00	38.50	40.00	71.50
Aug. 2-6	17.62½	14.55-14.60	10.00	103.00	17.00	38.50	40.00	71.50
Aug. 8-10	17.62½	14.80-14.97½	10.00	103.00	17.00	38.50	40.00	71.50
Aug. 11-17	17.62½	14.80	10.00	103.00	17.00	38.50	40.00	71.50
Aug. 18-22	17.62½	14.92½	10.00	103.00	17.00	38.50	40.00	71.50
Aug. 23	17.62½	14.92½	10.00	103.00	17.00	38.50	40.00	72.00
Aug. 24-25	17.62½	14.92½	10.00	103.00	17.00	38.50	40.00	72.50

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt.	$23.00-24.00‡
No. 2 Heavy Melt.	21.00-22.00*
No. 1 Busheling	23.00-24.00‡
No. 1 Bundles	23.00-24.00‡
No. 2 Bundles	19.50-20.50*
No. 3 Bundles	18.50-19.00*
Heavy Turnings	19.50-20.50*
Machine Shop Turnings	15.50-16.00
Mixed Borings, Turnings	15.50-16.00
Short Shovel Turnings	17.50-18.50
Cast Iron Borings	17.00-17.50
Low Phos. Steel	26.50-27.00

Cast Iron Grades

No. 1 Cupola Cast	32.00-33.00
No. 1 Machinery Cast	36.00-37.00
Charging Box Cast	29.00-29.50
Heavy Breakable Cast	26.00-27.00
Brake Shoes	29.50-30.50

Railroad Scrap

No. 1 R.R. Heavy Melt	24.50-25.00**
Axles	27.50-28.50
Rails, Random Length	26.50-27.50
Rails, 2 ft and under	32.00-33.00
Rails, 18 in. and under	33.00-34.00
Railroad Specialties	26.50-27.50
Angles, Splice Bars	26 00-27.00

‡Brokers paying up to $24 to cover last mill purchase at $21.
*Nominal.
**Brokers purchase prices.

CLEVELAND

No. 1 Heavy Melt. Steel	$20.00†
No. 2 Heavy Melt. Steel	19.00†
No. 1 Busheling	20.00†
No. 1 Bundles	20.00†
No. 2 Bundles	17.00†
Machine Shop Turnings	13.00†
Mixed Borings, Turnings	15.00-15.50
Short Shovel Turnings	15.00-15.50
Cast Iron Borings	15.00-15.50
Bar Crops and Plate	21.00†
Punchings & Plate Scrap	21.00†
Cut Structurals	22.00†

† Nominal.

Cast Iron Grades†

No. 1 Cupola	35.00-37.00
Charging Box Cast	30.00-31.00
Stove Plate	31.00-32.00
Heavy Breakable Cast	28.00-29.00
Unstripped Motor Blocks	26.50-27.50
Malleable	30.00-31.00
Brake Shoes	27.00-28.00
Clean Auto Cast	38.00-39.00
No. 1 Wheels	31.00-32.00
Burnt Cast	28.00-29.00

† Nominal.

Railroad Scrap

No. 1 R.R. Heavy Melt.	24.00-25.00
R.R. Malleable	32.00-33.00
Rail, 3 ft and under	36.00-37.00
Rails, Random Lengths	30.00-31.00
Cast Steel	25.00-26.00
Railroad Specialties	29.00-30.00
Uncut Tires	28.50-29.00
Angles, Splice Bars	32.00-33.00

VALLEY

No. 1 Heavy Melt. Steel	$24.50-25.00
No. 2 Heavy Melt. Steel	22.50-23.00
No. 1 Bundles	24.50-25.00
No. 2 Bundles	20.50-21.00
Machine Shop Turnings	14.50-15.00
Short Shovel Turnings	18.50-19.00
Cast Iron Borings	18.50-19.00
Low Phos.	23.50-24.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	24.00-25.00

CINCINNATI

No. 1 Heavy Melt. Steel	$18.00
No. 2 Heavy Melt. Steel	17.00
No. 1 Busheling	17.00
No. 1 Bundles	18.00
No. 2 Bundles	16.00
Machine Shop Turnings	9.00
Mixed Borings, Turnings	9.00
Short Shovel Turnings	10.00
Cast Iron Borings	10.00

Cast Iron Grades

No. 1 Cupola Cast	36.50
Charging Box Cast	26.00
Heavy Breakable Cast	25.00
Stove Plate	21.00
Unstripped Motor Blocks	18.00
Brake Shoes	19.00
Clean Auto Cast	36 50
Drop Broken Cast	39.00

Railroad Scrap

No. 1 R.R. Heavy Melt	20.00
R.R. Malleable	25.00
Rails, Rerolling	28.00
Rails, Random Lengths	28.00
Rails, 18 in. and under	36.50

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	$13.50-14.00
No. 1 Bundles	16.50-17.00
No. 2 Bundles	13.00-13.50
No. 1 Busheling	16.50-17.00
Machine Shop Turnings	9.50-10.00
Mixed Borings, Turnings	9.50-10.00
Short Shovel Turnings	11.00-11.50
Cast Iron Borings	11.00-11.50
Punchings & Plate Scrap	16.50-17.00

Cast Iron Grades

No. 1 Cupola Cast	28.00-29.00
Heavy Breakable Cast	24.00-25.00
Clean Auto Cast	28.00-29.00

BUFFALO

No. 1 Heavy Melt. Steel	$24.00-24.50
No. 2 Heavy Melt. Steel	20.50-21.00
No. 1 Bushelings	20.50-21.00
No. 1 Bundles	20.50-21.00
No. 2 Bundles	18.50-19.00
Machine Shop Turnings	13.00-13.50
Mixed Borings, Turnings	15.00-15.50
Cast Iron Borings	15.00-15.50
Short Shovelings	16.00-16.50
Low Phos.	24.50-25.00

Cast Iron Grades

No. 1 Cupola	29.50-30.00
No. 1 Machinery	32.00-33.00
Mixed Yard	28.00-28.50
Malleable	28.00-30.00
Heavy Breakable	26.00-27.00

Railroad Scrap

Rails, 3 ft. and under	29.50-30.00
Scrap rails	28.50-29.00
Specialties	25 00-26.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$20.50
No. 2 Heavy Melt. Steel	19.00
No. 1 Busheling	19.00
No. 1 Bundles	20.50
No. 2 Bundles	18.00
Machine Shop Turnings	14.00-15.00
Short Shovel Turnings	17.00-18.00
Mixed Borings, Turnings	14.00-15.00
Bar Crop and Plate	25.00
Punchings & Plate Scrap	25.00
Cut Structurals	24.00
Elec. Furnace Bundles	21.50
Heavy Turnings	20.50
No. 1 Chemical Borings	19.00-19.50

Cast Iron Grades

No. 1 Cupola Cast	28.00-29.00
No. 1 Machinery Cast	30.00-31.00
Charging Box Cast	27.00-28.00
Heavy Breakable Cast	27.00-28.00
Unstripped Motor Blocks	22.00-23.00
Clean Auto Cast	30.00-31.00
No. 1 Wheels	32.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$14.00-14.50
No. 2 Heavy Melt. Steel	13.00-13.50
No. 1 Busheling	12.00-12.50
No. 1 Bundles	13.00-13.50
No. 2 Bundles	12.00-12.50
No. 3 Bundles	nominal
Machine Shop Turnings	7.00-7.50
Mixed Borings, Turnings	7.00-7.50
Short Shovel Turnings	8.00-9.00
Punchings & Plate Scrap	19.00-20.00
Cut Structurals	19.00-20.00
Elec. Furnace Bundles	19.00

Cast Iron Grades

No. 1 Cupola Cast	23.00-24.00
No. 1 Machinery	24.00-25.00
Charging Box Cast	19 50-20.00
Heavy Breakable	19.50-20.00
Unstripped Motor Blocks	16.00-17.00
Malleable	20.00-21.00

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$11.50
No. 2 Heavy Melt. Steel	10.50-11.00
No. 1 Bundles	11.50
No. 1 Busheling	10.50-11.00
Machine Shop Turnings	5.50-6.00
Mixed Borings, Turnings	4.50-5.00
Short Shovel Turnings	6.50-7.00
Bar Crops and Plate	12.50-13.50
Punchings & Plate Scrap	12.50-13.50
Chemical Borings	8.00-8.50

Cast Iron Grade

No. 1 Cupola Cast	23.00-24.00
Mixed Cast	21.00-22.00
Heavy Breakable Cast	16.00-17.00
Stove Plate	19.00-20.00
Unstripped Motor Blocks	17.00-18.00

CHICAGO

No. 1 Heavy Melt. Steel	$22 00-23.00
No. 2 Heavy Melt. Steel	20.00-21.00
No. 1 Bundles	22.00-23.00
No. 2 Bundles	19.00-20.00
No. 3 Bundles	17.00-18.00
Machine Shop Turnings	15.00-16.00
Mixed Borings, Turnings	16.00-17.00
Short Shovel Turnings	17.00-18.00
Cast Iron Borings	16.00-17.00
Bar Crops and Plate	27.50-28.50
Punchings	28.00-29.00
Elec. Furnace Bundles	25.00-26.00
Heavy Turnings	21.00-22.00
Cut Structurals	26.00-27.00

Cast Iron Grades

No. 1 Cupola Cast	38.00-40.00
Clean Auto Cast	38.00-40.00
No. 1 Wheels	32.00-33.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	25.00-26.00
Malleable	32.00-33.00
Rails, Rerolling	34.00-35.00
Rails, Random Lengths	31.00-32.00
Rails, 2 ft. and under	35.00-36.00
Rails, 18 in. and under	36.00-37.00
Railroad Specialties	29.00-30.00
Angles, Splice Bars	32.00-33.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$23.00-24.00
No. 2 Heavy Melt. Steel	19.00-20.00
Machine Shop Turnings	13.00-14.00
Short Shovel Turnings	13.00-14.00

Cast Iron Grades

No. 1 Cupola Cast	32.00-34.00
Charging Box Cast	27.00-29.00
Heavy Breakable Cast	24.00-26.00
Brake Shoes	24.00-25.00
Clean Auto Cast	36.00-38.00
Burnt Cast	24.00-26.00

Railroad Scrap

R.R. Malleable	27.00-28.00
Rails, Rerolling	33.00-35.00
Rails, Random Lengths	27.00-28.00
Rails, 3 ft. and under	31.00-33.00
Uncut Tires	22.00-24.00
Angles, Splice Bars	29.00-31.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$18.00
No. 2 Heavy Melt. Steel	18.00
No. 1 Busheling	18.00
No. 2 Bundles	16.00
Machine Shop Turnings	13.00
Mixed Borings, Turnings	15.00
Short Shovel Turnings	15.00
Cast Iron Borings	15.00
Bar Crops and Plate	23.50
Cut Structurals	23.00

Cast Iron Grades

No. 1 Cupola Cast	31.00-33.00
Stove Plate	27.00
No. 1 Wheels	17.00-18.00

STEELMAKING SCRAP COMPOSITE

Aug. 27	$22.17
Aug. 20	21.92
July 1949	19.21
Aug. 1948	43.33
Aug. 1944	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00-21.00
R. R. Malleable	nominal
Rails, Rerolling	23.00-24.00
Rails 3 ft. and under	25.00-26.00
Angles and Splice Bars	22.00-23.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$17.00
No. 2 Heavy Melt. Steel	15.00
Nos. 1 & 2 Bundles	13.00

Cast Iron Grades

No. 1 Cupola Cast	23.00-25.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	17.00
Wheels	17.00
Rails, Random Lengths	17.00

SEATTLE

No. 1 Heavy Melt. Steel	$16.00
No. 2 Heavy Melt. Steel	16.00
No. 1 Bushelings	13.50
Nos. 1 & 2 Bundles	14.00
No. 3 Bundles	nom.
Machine Shop Turnings	11.00
Mixed Borings, Turnings	11.00
Punchings & Plate Scrap	22.00
Cut Structural	22.00
Elec. Furnace Bundles.	23.00

Cast Iron Grades

No. 1 Cupola Cast	20.00-22.00
Heavy Breakable Cast.	17.00
Stove Plate	17.00
Unstripped Motor Blocks	17.00
Malleable	20.00
Brake Shoes	23.00
Clean Auto Cast	23.00
No. 1 Wheels	22.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	17.00
Railroad Malleable	22.00
Rails, Random Lengths	17.00
Angles and Splice Bars	17.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	24.00
Electric Furnace Bundles	26.00

Cast Iron Grades

No. 1 Cupola Cast	27.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Rails, Rerolling	25.00

HAMILTON, ONT.

(Delivered prices)

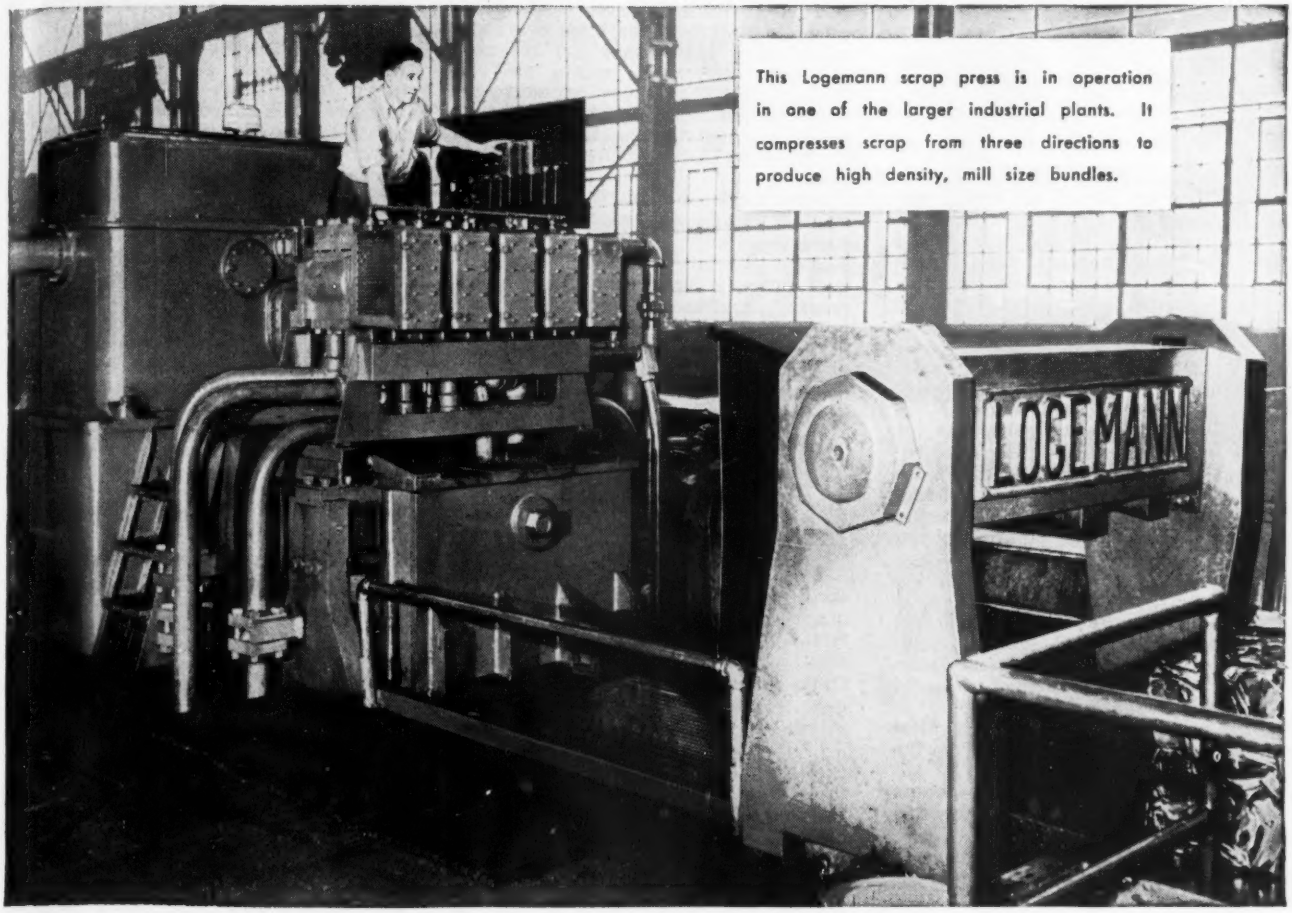
Heavy Melt.	$20.00
No. 1 Bundles	20.00
Mechanical Bundles	18.00
Mixed Steel Scrap	16.00
Mixed Borings, Turnings	14.00
Rails, Remelting	20.00
Rails, Rerolling	23.00
Busheling	14.00
Bushelings new factory, prep'd	18.00
Bushelings new factory, unprep'd	13.00
Short Steel Turnings	14.00

Cast Iron Grades*

Cast	33.00-35.00

* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.

UNIVERSITY OF MICHIGAN LIBRARIES



This Logemann scrap press is in operation in one of the larger industrial plants. It compresses scrap from three directions to produce high density, mill size bundles.

Self-contained.....
Triple Compression..
Automatically Controlled

LOGEMANN SCRAP PRESSES

handle high tonnages with minimum labor . . . at low cost!

LOGEMANN METAL BALERS

. . . are built in a large range of sizes to meet specific conditions. Let Logemann's engineering service help you arrive at the most efficient and economical way of handling your scrap.

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Both two-ram and three-ram models are available with automatic controls or for manual manipulation.

Logemann Bros. Co. have specialized in the production of scrap metal presses for sheet mills, stamping plants, scrap yards, and metal manufacturing plants of all types for nearly 75 years. Write for full information—please state the nature of your scrap and tonnage.

LOGEMANN BROTHERS COMPANY
3164 W. Burleigh Street • Milwaukee 10, Wisconsin

Sheets, Strip . . .

Supply tightens as demand increases. Cold roller reinstates quotas

Sheet Prices, Page 100

Philadelphia—Sheet deliveries are becoming more extended, with business increasingly brisk despite the fact shipments against new orders can no longer be made on any important grade before the Sept. 15 strike deadline. Hot-rolled sheets are available in five to seven weeks and even longer on certain mills. Cold-rolled sheets are on a still more extended schedule, with one eastern mill reinstating consumer quotas for the fourth quarter, claiming that requirements for that period are more than exceeding its estimated production. A midwestern mill is offering nothing in this grade before December.

Much can happen, however, to alter the picture before the next quarter gets far under way. A peaceful solution of the steel labor controversy could well result in cutbacks and a substantial seasonal drop in tin plate production in the final 3-month period could loosen schedules on the cold-rolled product. For the present, these factors cannot be accurately appraised, and producers have to be guided accordingly in making their current promises.

Coated sheet deliveries also extend well into the fourth quarter—through the entire quarter in certain instances—but adjustments may be possible later. Stainless sheets and some of the other specialties can still be had before the end of September.

Locally, the largest single improvement in sheet demand is attributed to buying by the stove industry. At least one or two stove makers are back to more than 70 per cent of their full operating capacity and are putting pressure on the mills for as prompt delivery of cold-rolled and enameling sheets as possible, taking overages and rejects in some instances where available for nearby shipment.

Pittsburgh—Relatively large backlogs of orders held by mills for galvanized sheets are expected to be augmented substantially over the next few weeks as a result of anticipated additional tonnage requirements for corn storage bins. The government's program, established early in August, is estimated to involve nearly 100,000 tons of galvanized steel products for delivery within four to eight weeks. Urgency of the program has resulted in considerable reshuffling of production schedules.

Further easing in coating regulations covering terne plate is expected. Present 20-pound coating limitation is expected to be restored to 40-pounds, thus improving demand prospects for roofing ternes. This will accentuate indirectly continued tightness in supply of cold-rolled sheets. October production schedules for cold-rolled sheets are filling rapidly, due to well sustained demand from the automotive industry as well as moderate improvement in specifications from miscellaneous consumers.

Little change is noted in the demand-supply position of other sheet and strip classifications. All cold-rolled strip producers here are on a competitive price basis and are able to make deliveries within two to three weeks. Customers' excessive inventories are being worked off gradually, but many users still have relatively large stocks of premium-priced steel.

New York—Although sheet deliveries generally are extended well beyond the strike deadline of Sept. 15, demand continues to hold its own, if not actually reflecting further increase. End-use requirements are broadening and consumers continue interested in building up inventories, particularly now that no reductions in prices by leading producers appear imminent.

Leading sellers are quoting six to eight weeks on hot-rolled with most booked up entirely through October on cold-rolled and galvanized sheets. In fact, one seller has nothing left in galvanized for November shipment.

Boston — Most carbon sheet and strip schedules are filled for third quarter, hot-rolled bookings being for October with cold-rolled and galvanized orders for November delivery. Only on stainless specialties and alloys are there openings for earlier shipment. Flat-rolled orders are heavier, including those for electrical grades placed by motor and transformer builders. Household fuel tank shops are more active, resulting in heavier demand for No. 12 gage hot-rolled. In case of peaceful settlement of steel labor contracts, some readjustment of scheduled orders would not be unlikely.

Cleveland—Strong demand for most flat-rolled carbon products is expected by one producer to continue through the fourth quarter of 1949. Without effort this producer already has booked orders for flat-rolled for October and November delivery. Heaviest in demand of carbon flat-rolled products are hot-rolled sheets, cold-rolled sheets, and galvanized sheets. Putting additional pressure on the already tight supply of galvanized is the government grain bin construction program. Because of the heavy demand, Republic Steel Corp. continues monthly quotas on galvanized. It is now issuing quota figures for November. The company also continues quotas on enameling iron, this product and galvanized sheets being the only flat-rolled items remaining under such limitations.

Demand for silicon coil stock remains strong, and handmill silicon sheets which had been in easy supply, are moving a little faster.

Cincinnati — Bookings of district mills assure full schedules through October on carbon sheets with a tight supply situation indicated in galvanized and cold-rolled. Backbone of current business is the automotive field. Ordering for household equipment has recently turned upward and heavier demand from this source is expected in the next quarter.

Chicago — Shortage of galvanized sheets, most pronounced in 22 and 24 gage sizes, continues to plague fabricators. Some farm bin makers have partially solved the steel scarcity problem by designing cribs using a minimum of sheets, constructing the sides out of heavy mesh and the roof supports out of U-shaped heavy gage sheets. Plain hot-rolled carbon sheets are sometimes specified in substitution for the scarce galvanized. Roofs of these structures account for a large part of the galvanized tonnage. Cold-rolled sheets, the other tight commodity with district mills, continue to account for a substantial portion of new business booked but with available rolling time moved back as far as December. In one local case, current demand has fanned out and other products are accounting for an increasingly greater share of new ordering.

Birmingham—Current demand for some items in sheets, especially roofing is less pressing. There is negligible change in the overall situation, however, which finds the general supply lagging behind demands. Galvanized sheets supply is especially short. Considerable volume of strip is moving to market from accumulated stocks. Production is on a moderate basis.

Dallas — Demand for flat-rolled items is steady to strong in the Texas market, with cold-rolled and galvanized sheets in strongest demand. Supplies are generally adequate, though deliveries are still spotty, a hangover from a reluctance during the summer to buy beyond foreseeable needs. Greater confidence in building up inventories, following a hand-to-mouth buying practice the last several months, is beginning to make itself felt in increased buying.

Los Angeles — Although demand for most flat-rolled products remains firm, requirements for cold-rolled strip are particularly strong. Some interests still have surplus available, but prices for this material are stiffening. Mills and jobbers report that many of their old customers have worked off their inventories of cold-rolled strip and are specifying for the first time in months. One major producer is offering 7-week delivery and reports pressure from consumers is considerably greater than a month ago.

San Francisco—Increased interest in flat-rolled products is picking up. This region's biggest producer is operating its sheet mill at full capacity. Consumers, who had been holding back orders in hope of a price reduction, now feel chances of a price cut this autumn are dimming. As a result, they appear more willing to place orders for distant delivery.

Tool Steel . . .

Tool Steel Prices, Page 101

Pittsburgh — Tool steel producers note a slight upturn in order volume, although not sufficient to step up production schedules. Many interests are operating at 60 per cent, or less, of capacity. A growing number of consumers report an improvement in their inventories. In some instances, customers' stocks became unbalanced in their efforts to reduce inventories to more realistic levels. Excluding some specialty items, sellers are in position to offer prompt delivery from mill or warehouse depot stocks. Competitive conditions have forced nearly all producers to adopt a flexible pricing policy to absorb freight in meeting competition where desirable.

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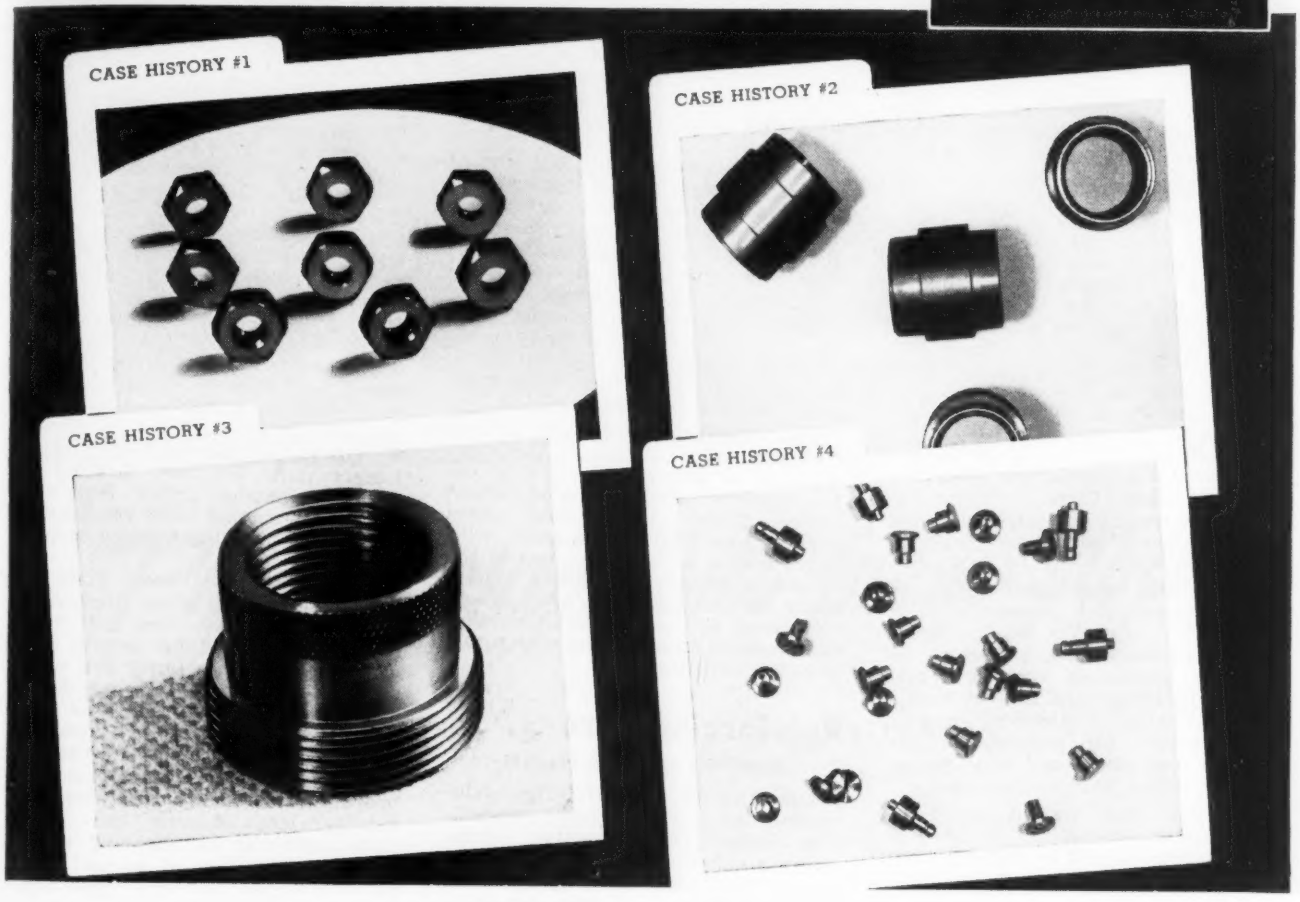

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Structural Shapes . . .

Structural Shapes Prices, Page 101

New York—While little outstanding tonnage is being placed here there is a steadily increasing demand, particularly for public account. State road work is especially active and several schools are being figured. In addition, there is a fair amount of semi-public work, such as hospitals. Fabricators in general have not been able to book sufficient new tonnage to offset a decline in order backlogs. Some believe a balance in this respect will be reached within another few weeks. Shape deliveries are slightly more extended. One leading eastern producer is now quoting around four to five weeks on standard sections and within five weeks on certain wide flange specifications.

Fabricated structural steel bookings were higher in July at 124,256 tons, according to American Institute of Steel Construction. Estimated bookings in the first seven months total 825,246 tons, or approximately 27 per cent below same period last year. July shipments of 141,120 tons were slightly under June. Shipments in the first seven months of 1,148,-197 tons were slightly above the 1,-126,429 tons for the like 1948 period. Order backlog for the next four months is 605,426 tons.

The new freight rate into New York from Bethlehem, Pa., will be 29 cents, effective Sept. 1.

Philadelphia—Structural inquiry is well sustained, due primarily to a steady flow of public work. However, business is not sufficient to maintain operations with a result that most shops are still reducing order backlogs. Standard shapes are available for delivery within three to four weeks and wide flange sections within four to five weeks.

Proposed new freight rates to Philadelphia, scheduled to become effective Sept. 1, will be 20 cents from Bethlehem, Pa.; 54 cents from Pittsburgh.

Boston—Except for wide flanged sections, fabricating shop inventories are in balance; considerable plain material was taken in during recent shop labor troubles and volume is sufficient to meet contracts under commitment. While bridge inquiry being estimated is slightly heavier, work in other directions lags. Third quarter shipment is still possible on standard structural shapes from mills. Repairs to the Massachusetts avenue bridge over the Charles river take 900 tons of steel grid flooring.

Buffalo — McLain Construction Corp., Kenmore, N. Y., is low bidder on a state project for construction of three four-span I-beam bridges on the Ontario Thruway in Erie county, New York. The firm bid $864,053.80, considerably below the state engineer's estimate of $1,137,000. The bid also includes construction of concrete road approaches, a detour road and necessary grading and drainage facilities.

Birmingham — With considerable new construction under consideration prospects have improved for increased demand for plates. Some of the new construction is work shelved when construction costs were at a peak, but some new projects indicate a general revival by next spring.

Dallas — With the emphasis on Texas' extensive building program, exceeding last year's by a good margin, placed on non-residential construction, demand for structural shapes is showing a corresponding increase. Industrial, warehousing, and public works projects represent a heavy segment of this state's building program that has touched $62,500,000 this year. Significant in the public works program is work on sixteen dams in various stages of construction that represent an outlay of considerably over $240 million. Greater confidence in the general economic outlook in this area is raising prospects for greater activity.

Los Angeles — Structurals are in lightest demand of the major steel products. Since inventories are heavy, competition steadily becomes more severe and prices are softening. This situation is in direct contrast to the present surge of construction in Southern California, but the majority of that activity is in concrete construction requiring large tonnages of reinforcing bars, with only a little structural steel.

San Francisco—Structural business continues in the doldrums. Although engineering projects awarded in the 11 western states totaled about $1349 million in the first seven months this year, compared with $1118 million a year ago, most of the contracts have been public works. Many of these projects have drawn on eastern sources for steel supplies, and western producers of structurals have not benefited.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 100

Los Angeles—Although the reinforcing bar market is more competitive, demand remains active. Many projects either are under way or are coming out for bids, with most of these involving concrete construction. One leading fabricator, currently operating at 80 per cent of capacity, reports more jobs being offered for bids than its estimators can handle. This firm's tonnage during the past three months has been running about even with the same period in 1948. Present activity is concentrated largely on school buildings, highway bridges, and other public works, with some good-sized industrial projects beginning to come out. The industry looks for a substantial program of new construction by the U. S. Navy's guided missile research center at Point Mugu, Calif.

Portland Oreg.—Plant of Oregon Steel Mills is operating two of three furnaces and reports a substantial order backlog. Several sizable contracts are being rolled including 8000 tons for the Hungry Horse power project in Montana. Demand for small tonnages is steady with the aggregate tonnage large. Public works and general construction are absorbing a large amount of reinforcing. Mercer Steel Co., Soule Steel Co. and Truscon Steel Co. have substantial order backlogs.

Plates . . .

Plate Prices, Page 101

New York—Despite a general overall improvement in steel inquiry, plate demand still lags. Few specifications are coming out from the railroads and ship yards and there is little disposition among jobbers and other consumers to order inventory replacements. Present types of construction require a relatively small amount of plate work. Some seasonal improvement is noted for making light fuel oil tanks and heaters, but the overall effect is slight.

New car lot freight rates into New York, will be 32 cents from Conshohocken, Pa.; 33 cents from Claymont, Del.; 34 cents from Coatesville, Pa.; and 40 cents from Harrisburg, Pa.

New freight rate from Sparrows Point, Md., will be 42 cents.

Boston — With another increase in freight rates Sept. 1, Pittsburgh district mills will be at further disadvantage in New England distribution which in case of plates approximates $5 per ton; freight charges have nearly doubled since 1938. Tank shop orders are slightly heavier and demand for plates is stronger. Weldment shop operations are also up with backlogs improved which is showing up in better tonnage of heavier plates. Larger mills are now booking for October, having filled September schedules; smaller units can take orders for September delivery in most instances.

Philadelphia — District plate mill operations are a shade higher, although still spotty. One mill, which recently suspended for several days, was operating on a fairly dull schedule last week; another, which had been operating part time, was down completely. Other district mills likewise are varying their operations from week to week, but seldom are operating more than four days and usually less. Buyers can obtain early deliveries by shopping around a little—deliveries of around three to four weeks and less upon occasion.

Proposed freight rates into Philadelphia, Sept. 1, from plate mills at Claymont, Del., and Conshohoken, Pa., will be 9 cents; from Coatesville, Pa., 15 cents; from Sparrows Point, 29 cents; from Harrisburg, 33 cents.

Birmingham—Plate output is sustained here and at Gadsden, although Tennessee Coal, Iron & Railroad Co. is being called upon to supply the major market requirements. Demand for plates holds up surprisingly well, the aggregate coming from widespread miscellaneous users in the face of considerably less need on the part of carbuilders and ship-repair plants. Deliveries are easier in most instances.

Los Angeles — While plate needs have continued in fair volume through the year, current mill bookings are better than at any time in the past 90 days. Requirements of pipe and tank fabricators, as well as warehouses, are tending upward. Possibility of a steel strike is having some effect on consumer psychology, but in light of generally low inventories most of the current buying is attributed to production requirements.

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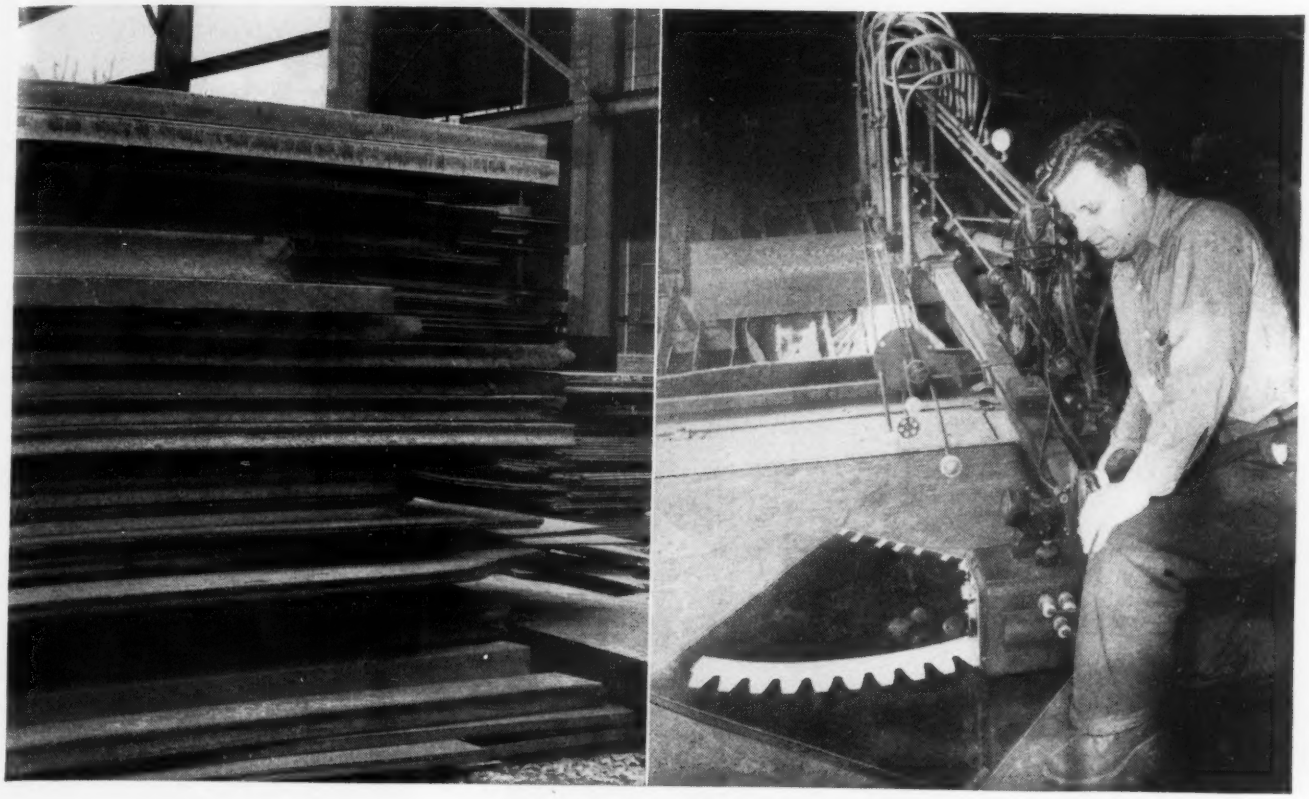

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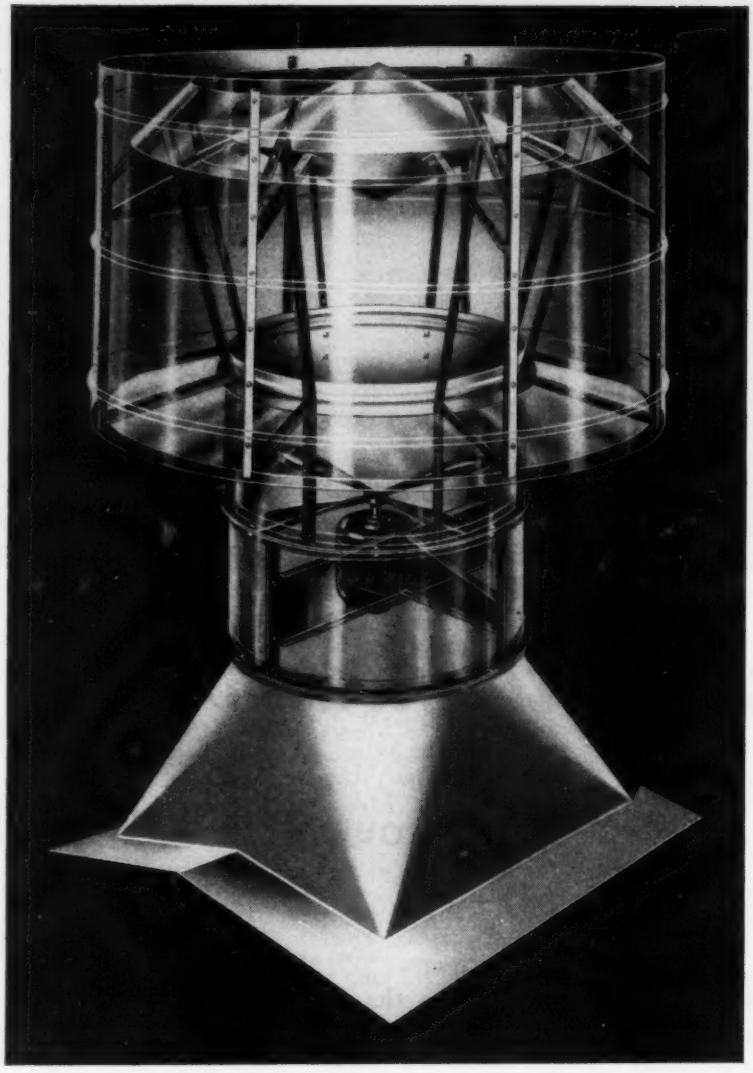

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Wire . . .

Wire Prices, Page 101

Dallas — Wire products demand is holding steady, with nails market firming up as a result of extensive building operations in this section. Supplies are adequate. Prices are unchanged.

San Francisco—Columbia Steel Co. has put its fourth open hearth back in operation at the Pittsburgh plant as a result of sharply increased demand for carbon steel wire. This raises ingot output at Pittsburgh 20 points to 80 per cent of capacity. A heavy volume of orders for carbon steel wire, to be used chiefly in manufacture of springs, has been coming from furniture and auto manufacturers. Columbia officials attribute this trend to fears of a steel strike this autumn.

Steel Bars . . .

Bar Prices, Page 100

New York—Hot carbon bars continue to move a little more actively, with deliveries of most leading producers ranging four to six weeks. In some instances earlier deliveries can be obtained, but they are the exceptions.

Cold-drawn carbon bar demand still lags, having failed to respond to stimulating influences in the same measure as inquiry for hot carbon bars. Deliveries can still be had in two to three weeks or less, especially where drawers have been able to build up fairly substantial stocks. As a matter of fact, prompt shipments are available in many sizes. Alloy bar promises are becoming slightly more extended. Hot alloy grades are available in around three to four weeks, five to six weeks when special treatment is required. Cold alloy bars can be shipped in late September and early October, but in much less time where specifications are in stock and do not have to be processed.

Sept. 1 freight rates into New York from Buffalo and Pittsburgh are 58 cents and 62 cents, respectively.

New freight rate from Johnstown, Pa., will be 54 cents.

Pittsburgh—Cold finishers report a well diversified moderate improvement in bookings this month, due to increase in customers' production schedules and necessity to balance out inventories resulting from too drastic stock reduction in some size classifications. An undeterminable portion of increased demand also is attributed to inventory protection buying in event of a steel strike next month. Most standard sizes of cold finished carbon and alloy bars are available from stock, with deliveries extended 4 to 6 weeks on specialties. Hot-rolled carbon and alloy mill deliveries generally are available within 4 to 5 weeks.

Boston—Carbon bar buying, slightly heavier, is still slack with some producers able to make delivery this quarter; few mills are filled for September and are booking for October. While inventories are gradually declining, notably in small sizes, substantial cold-finished tonnages are held by some consumers and warehouses.

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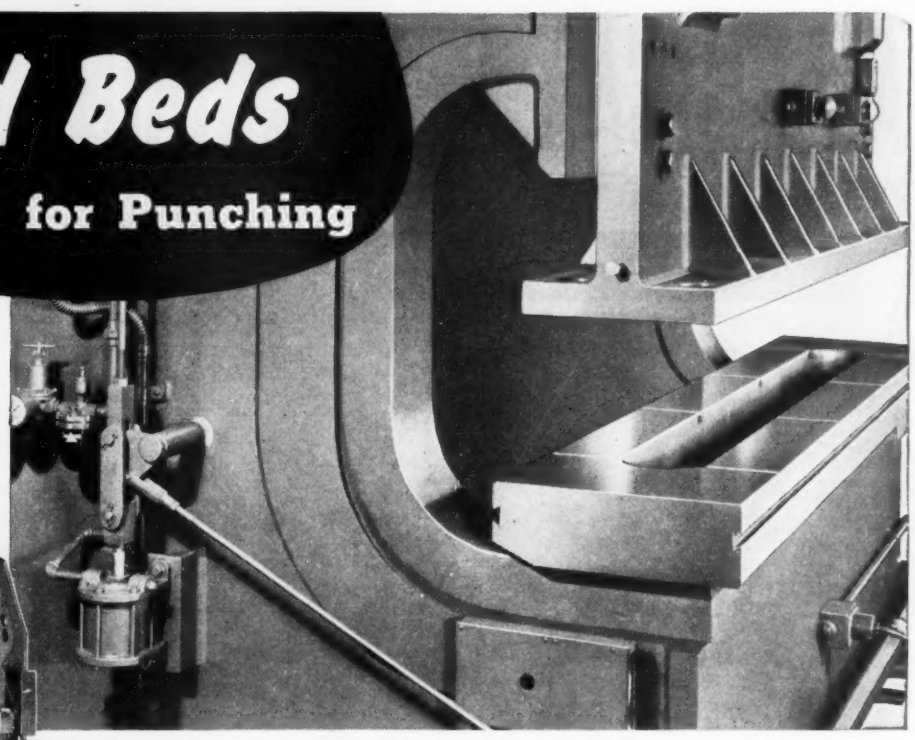
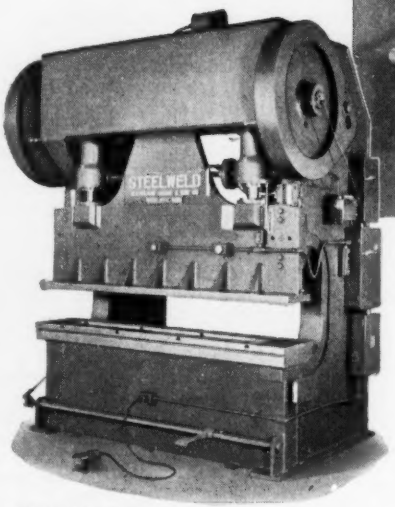
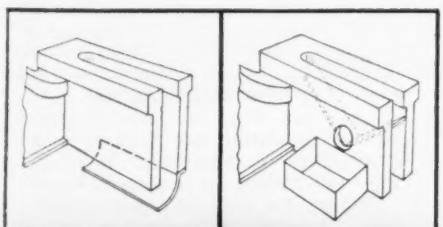
Slotted Beds for Punching





Model H4-6 Press with slotted bed. Handles plate to 6' 0" long between end housings. Operated by foot treadle or air-electric control.



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Tubular Goods . . .

Tubular Goods Prices, Page 101

Pittsburgh — Jobbers' stocks of standard pipe items still are not in satisfactory balance despite moderate headway mills have made against order backlogs in the last few months. Drill pipe, oil well tubing and casing are expected to remain in relatively short supply throughout remainder of this year, although some progress against order backlogs also is reported in this product group. Line pipe deliveries in large size classifications are extended into 1954. Demand for pressure tubing continues to top that for mechanical by a sizable margin, with backlogs extended three to eight weeks.

National Tube Co. will concentrate output of all tubing except electric welded, at Ellwood City, Pa., during period of new mill installation at Gary, Ind.

Cleveland—Substantial drop in ordering of oil country tubular goods for fourth-quarter delivery is enabling one producer to step up production of line pipe, a product continuing in heavy demand. On the basis of orders now being accepted for line pipe, up to 16-inch diameter, for delivery in 1950 this producer continues to be optimistic over prospects for tubular goods business. On larger diameter line pipe, this producer is booked into 1952.

Jobbers continue to take their quotas of standard pipe, but a decline is noted in orders from sprinkler manufacturers.

Drop in demand for oil country tubular goods for the fourth quarter may be as much as 40 to 50 per cent and results from a move to reduce field inventories.

Portland, Oreg. — American Pipe & Construction Co. has sufficient work under contract to carry to the end of the year, the largest 3500 tons being for the Soap Lake 22-foot siphon, Columbia Basin project. Another large project involves 1000 tons for penstocks for enlargement of generating facilities for California-Oregon Power Co. Miscellaneous other tank jobs comprise the balance of a substantial backlog.

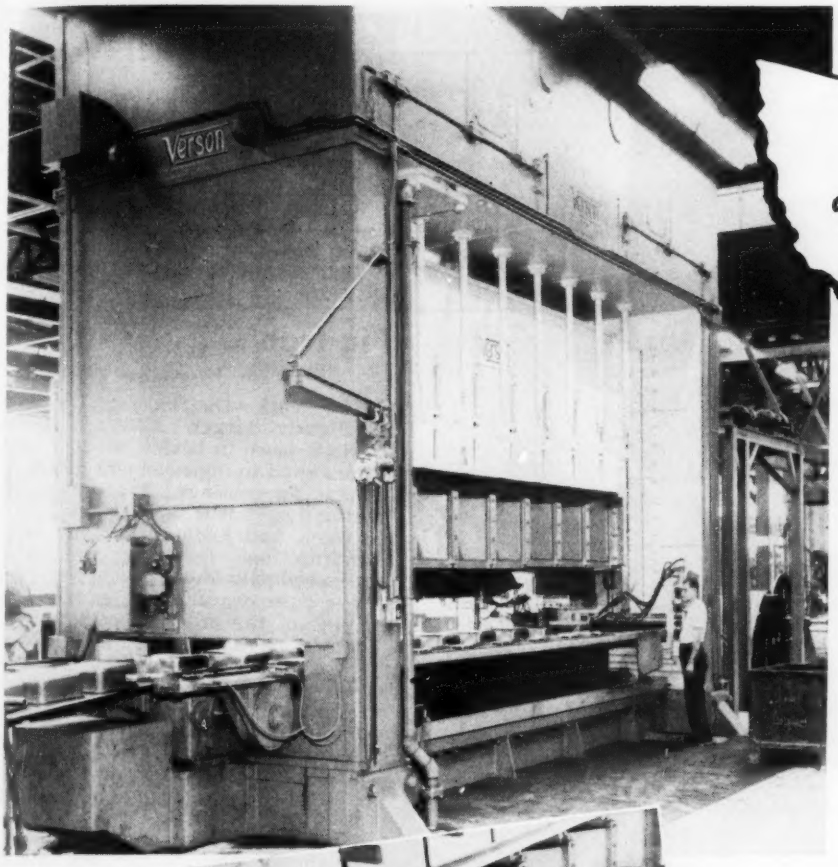
American Pipe is operating three shifts. Inquiries are numerous but increasing competition is noted. Pipe fabricating is largely seasonal.

Inquiry for cast iron pipe goods is fair. Immediate deliveries can be made as suppliers have considerable stocks. Pacific States Cast Iron Pipe Co. has improved its competitive position by increased facilities at the Provo, Utah, plant where production has quadrupled under the de La Vande method.

Tin Plate . . .

Tin Plate Prices, Page 101

Pittsburgh—Tin mill specifications for October scheduling are holding up better than anticipated, reflecting primarily improvement in general line can requirements and growing conviction among consumers that lower prices will not be posted this year. Maximum tin plate price level on 1950 contracts with major can makers is expected to depend largely



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on ultimate terms of new steel wage contracts and competitive conditions prevailing at that time. Should another wage-price spiral develop, anticipated easing in fourth-quarter tin plate demand likely would fail to develop since consumers would attempt to augment inventories prior to establishment of probable higher prices.

Weirton, W. Va.— Weirton Steel Co. has been awarded contract for 19,700 boxes of tin plate, $356,199, by Chicago procurement office, Corps of Engineers.

Pig Iron . . .

Pig Iron Prices, Page 102

New York—District foundry melt is slightly larger, although it is ascribed more to better weather conditions than to improvement in actual demand for castings. Pig iron specifications have been accordingly a little freer, with indications that some foundries have let their inventories get exceedingly low. This is reflected in the rush character of a fair percentage of the orders placed.

Some sellers anticipate a more appreciable improvement in demand after Labor Day, assuming there are no untoward developments in the steel labor situation. In view of the general improvement in steel demand, they look for greater diversion of production to basic from foundry iron. They regard this as particularly true with integrated producers, where demands for hot metal from steel mill affiliates may soon pick up substantially at the expense of foundry iron production.

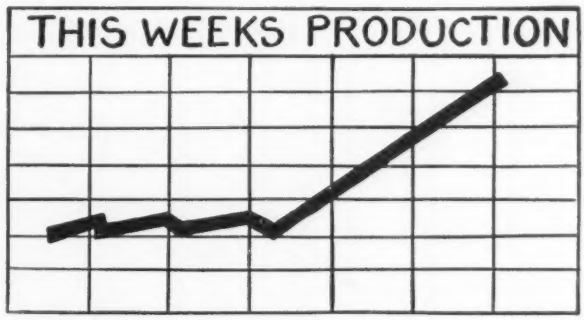
Under such circumstances, this step likely would come before any move is made to expand pig iron production, such as by blowing in additional furnaces. Once foundries see a definite trend in this direction, they may be disposed to specify more freely, although pig iron producers have substantial inventories of foundry iron on hand. Any sustained expansion in steel demand would stimulate buying of castings and, indirectly, that of pig iron.

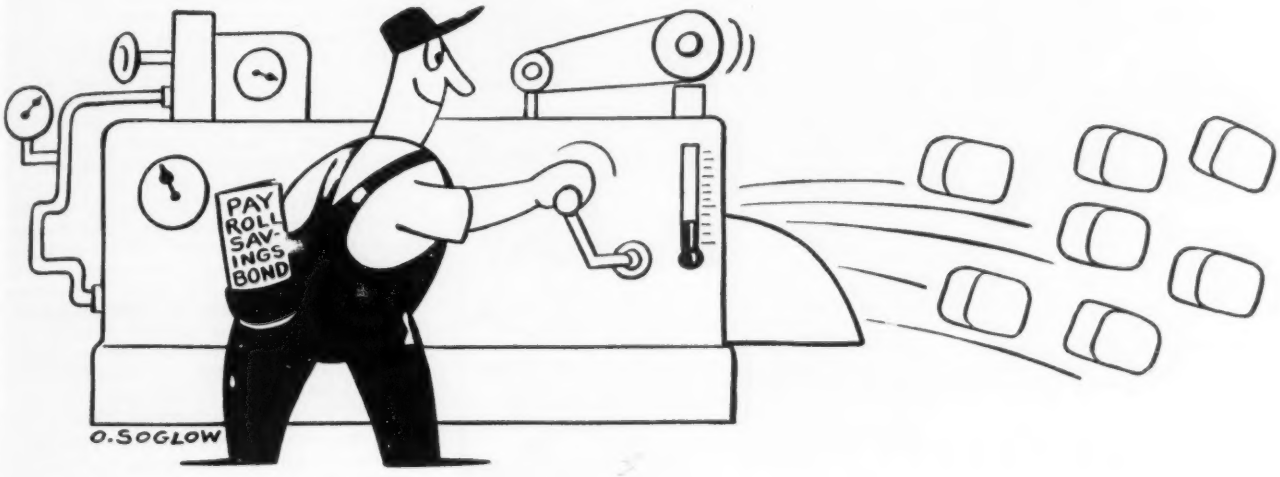
New freight rates from Bethlehem, Pa., to Newark, N. J., and Brooklyn, N. Y., will be $2.63 and $4.29 per ton, respectively.

Boston—Shipments in August are smaller than expected and rebound from previous month's low is nil. Some improvement is looked for in September, but outlook for any substantial increase in foundry operations in near future are clouded. Numerous shops have not taken in iron for months and inventories are low; so also are backlogs and new volume. Users of basic are also buying sparingly with steel operations in this district probably lowest in the country and under the break-even point.

Philadelphia—Pig iron sales in August will show a slight increase over July, with indications that September will show a further small gain. Improved weather conditions appear to be an important factor in the present improvement, as foundries, in particular, are able to melt at a more consistent rate. The principal factor is the higher rate of operations following vacations.

Under the proposed new freight





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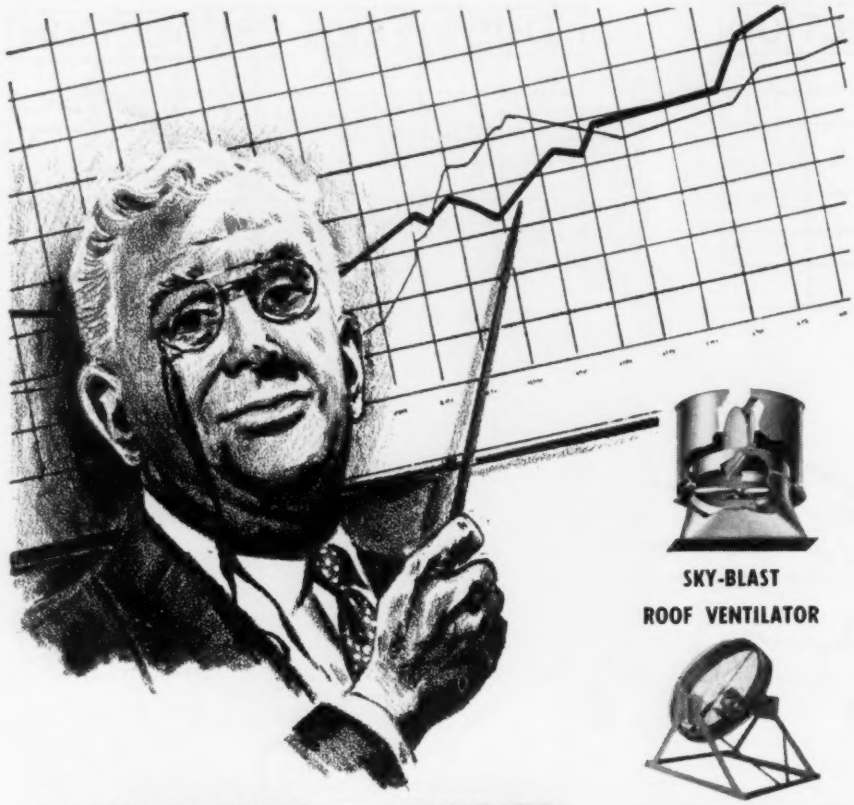

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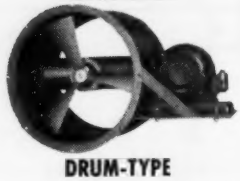
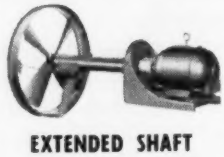


DRUM-TYPE FOR DUCTS AND STACKS



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DIVISION OF ROBBINS & MYERS, INC.

SPRINGFIELD 98 OHIO

schedules, effective Sept. 1, the rate from Swedeland, Pa., to Philadelphia, will be $1.44 per ton; from Bethlehem, $2.39; from Steelton, $3.09. The new rates, rounded off to the closest cent, represent a 10 per cent increase over those effective prior to the 6 per cent interim advance of last January.

Pittsburgh—Merchant iron demand has failed to continue the slight upturn noted early in August when many concerns resumed operations after mass vacation shutdowns. Merchant iron producers continue to augment stocks on hand prior to July 16 strike threat. Despite slight improvement in ingot operations, integrated steel producers have not returned to service some of the blast furnace units blown out early this summer.

Cleveland—Demand for merchant pig iron remains light. Although some foundries have stepped up operations to a five-day week, others have been reducing, some now working only one day a week. Requests for immediate delivery on new orders for castings are viewed as an indication that some completions have occurred in inventory reductions. Since firming of prices of foundry grades of scrap, buyers of castings have been less inclined to ask for price reductions.

With merchant pig iron demand at a low level, one producer here continues to turn out iron only as needed to supply stockpiles from which current orders are filled.

Prices remain unchanged.

Buffalo—Merchant pig iron sellers are watching closely the progress of the basing point bill in Congress, lending credence to rumors that enactment of the legislation would be followed immediately by a return to that method of pricing. Competition continues keen for foundry business, but there is no indication of price concessions in this district. The call for merchant iron, however, is showing moderate improvement, due partly to the low level of melters' stocks.

Chicago—More normal buying of merchant iron and foundry coke is being done. Inventory reductions have about run their course, vacations largely are over, and operations on the whole have improved. Specifying prompt delivery has become common, some of which is done against possibility of a steel strike. Attitude of many foundrymen, however, is that if a strike occurs disruption to steel products within castings consuming plants will preclude the need for castings. Hence, there is only limited disposition to buy iron for stock. Some merchant iron sellers indicate they probably will not compute the forthcoming freight rate increase, but will submit their bills to consumers with the previous freight charge, leaving the additional percentage increase to be computed by the customer.

Cincinnati—Pig iron demand is better, with a modest flurry of buying experienced in both northern and southern iron. The continued high melt on automotive parts, accompanied by exhaustion of iron stocks, accounts for part of the buying. There is also an upward trend in other types of castings to lift the district level above the low point

reached in July. Business of jobbing foundries has been slow to react from the summer dullness, but here too an improvement is forecast for next month.

Birmingham—Marked improvement is noted in the pig iron market where recovery is increasing steadily. Much of this is attributed to the sharp recovery in scrap and to depletion of inventories in many instances. Shutdown of Tennessee Coal, Iron & Railroad Co.'s ore mines due to a labor dispute may hamper steel production there in short order.

St. Louis—Higher scrap prices here are beginning to perk pig iron sales. This, plus a steady, moderate increase in foundry buying, leaves ironmakers optimistic September will be a good month. Last month they began hearing from foundries which had been out of the market for several months, some since January. Demand is tempered somewhat by the fact inventories had been rebuilt in July in anticipation of a steel strike. Present buying is in better quantities, although many are still ordering on hand-to-mouth basis. Furnace stockpiles are holding level, even though half the blast furnace capacity here is banked.

Iron Ore . . .

Iron Ore Prices, Page 102

Cleveland — Consumption of Lake Superior iron ore declined last month to 5,258,321 tons from 6,248,535 tons in June and 6,479,032 tons in July of last year, according to the Lake Superior Iron Ore Association, this city. This brought the total for the first seven months to 48,423,087 tons compared with 44,820,566 tons in the like 1948 period. Furnaces in the United States accounted for 5,048,029 tons in July and 46,760,206 tons in the first seven months of 1949.

As of Aug. 1, 51 blast furnaces were idle in the United States, a gain of 7 during the month and 37 since Aug. 1, 1948, while 2 were idle in Canada. The number in blast totaled 134 in the United States and 8 in Canada as of Aug. 1, compared with 170 and 9, respectively, on the same date a year ago.

Total stocks of ore at the beginning of this month amounted to 35,063,647 tons, an increase of 7,367,501 tons over the 27,696,146 tons reported as of July 1 and an increase of 2,452,862 tons over the amount reported Aug. 1, 1948. Stocks include 29,793,201 tons at furnaces in the United States, 1,699,506 tons in Canada and 3,570,940 tons on Lake Erie docks in this country.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 102

Pittsburgh — Connellsville beehive coke output is restricted to a very few hand-drawn operations. No significant improvement in foundry coke consumption or demand is noted. Inventories of furnace coke among integrated mills have shown little change. Steel producers are offsetting the effects of the three-day per week schedule in coal mines by supplementary purchases of commercial coal.

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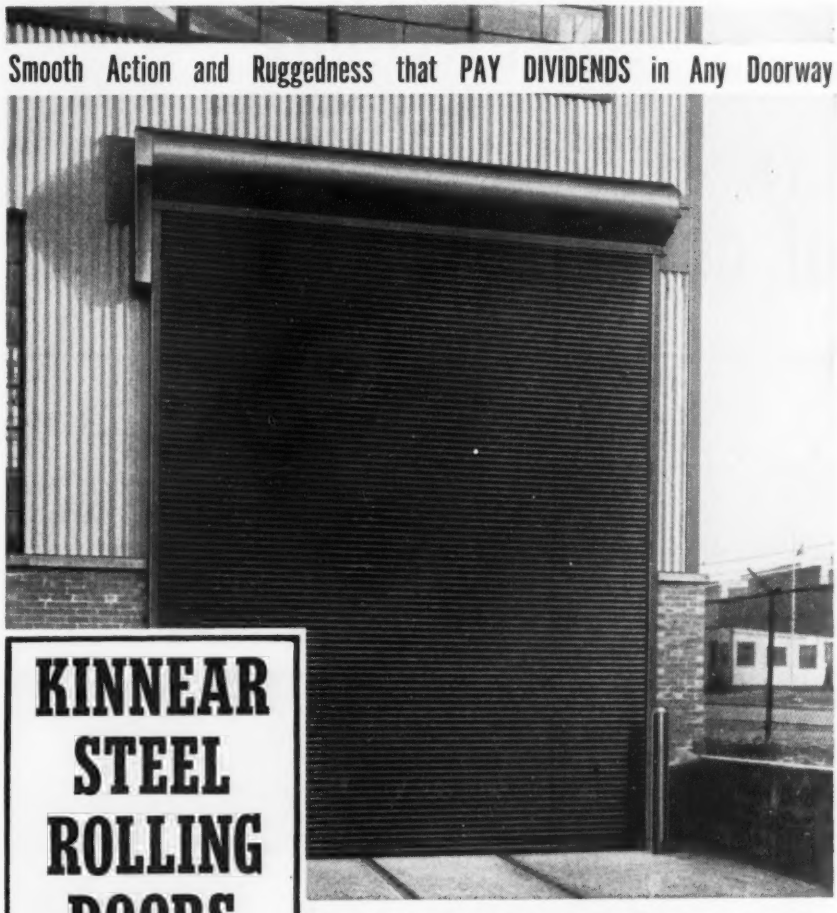

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Above installation shows how hood of Kinnear Rolling Door can be mounted on building exterior where desired. May also be concealed above lintel or mounted on inside wall.

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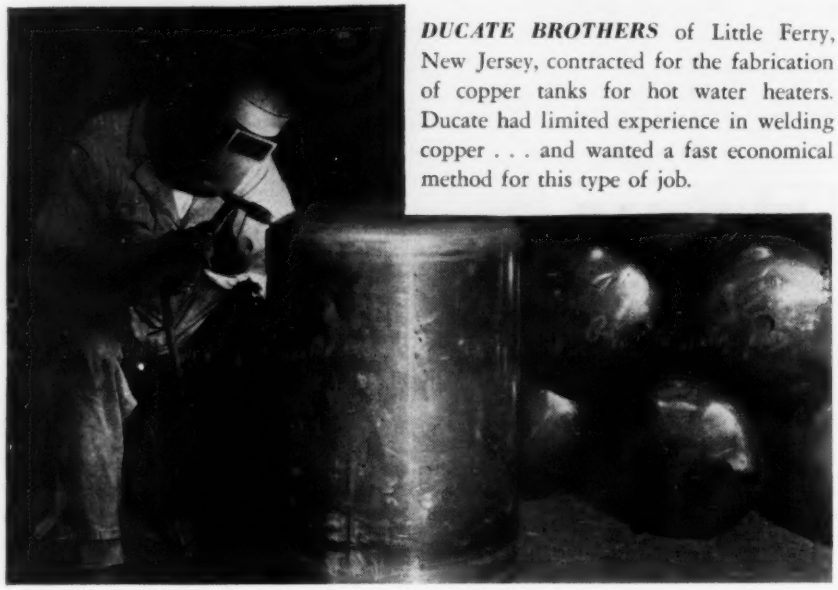
Heliwelding speeds fabrication of copper hot water tanks



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Warehouse . . .

Competition is keener with some price shading noted in Chicago. Delivery charges up

Warehouse Prices, Page 103

Chicago — A price war between warehouses is evident here, although the skirmishing is limited so far to cold-rolled strip. F.o.b. warehouse prices range from 6.15c to 6.65c, with the latter price being quoted by the majority of distributors. The price has fluctuated between these two figures for about two weeks, one company having put the lower price in effect on Aug. 4 and the higher one on Aug. 20. Stability is expected to be attained in the near future, however, and probably at the higher quotation because the supply of this product is restricted, although necessity for importation of it from out of the district has dwindled.

Warehousemen, who have long been aware that the city delivery charge of 15 cents per 100 pounds did not cover their costs, have within the past few weeks advanced this charge to 20 cents.

Meanwhile, demand continues active for major products and a pick-up in shipments to consumers, averaging about 10 per cent above July, is recorded by some distributors.

Boston—Prices are being revised upward by warehouses to cover increase in freight rates Sept. 1. Competition with prewar intensity is back with prices none too steady; some warehouses are shading prices and absorbing part of the freight. Inventories of cold-finished bars are heavy in some instances.

Philadelphia—Consumers and jobbers are specifying hot carbon bars more actively. Delivery is still available before the end of September on practically all sizes. There is a continued demand for cold-drawn carbon bars, with a number of the smaller sellers able to make delivery from stock. Alloy bar inquiry is holding its own, with supply a shade tighter, although four and five weeks can usually be promised by sellers.

The new increase in freight rates, effective Sept. 1, will likely not be immediately reflected in higher prices out of warehouse. Jobbers probably will await for at least another two weeks or so until they can better gage the outcome of the steel wage controversy.

Cleveland—Growing consumer interest in use of secondary sheets as a means of holding production costs down has prompted a leading warehouse here to consider adding a line of secondary material.

Pittsburgh—Shipment from steel warehouse stocks this month are expected to record moderate improvement over those in July, partly due to protective buying but to greater extent attributed to balancing out of inventories and slight upturn in metalworking operations. Warehouse steel inventories are more than adequate in specialty steel products; carbon grades are in good balance, with exception of galvanized sheets, some pipe items and wide flange beams. As in case of mill consumers, warehouse steel purchases have im-

proved slightly on a selective basis.

Cincinnati—Some improvement is noted in volume of business done by steel jobbers who now have stocks adequate to meet district demands promptly and on specification without resort to wasters or substitute material. Ordering is for nearby needs and in small tonnages when contrasted to buying habits earlier this year. Some galvanized sheets are to be had, although supply is tight.

Los Angeles—Jobber activity and customer psychology are improving. Firmness in demand extends throughout the list of major products, with the single exception of structurals. Stringency of galvanized supplies continues, particularly in lighter gages. Several leading warehouses have established a new discount on cold-rolled strip in large quantities. Previously quoted at 7.60c per pound, warehouse, on quantities of 2000 lb and over, cold-rolled strip now is being quoted also in quantities of 6000 lb and over, at 7.35c per pound warehouse.

Portland, Oreg.—Wholesale jobbers report a good turnover, but buyers are placing smaller orders covering current needs. Inventories are practically complete; prices are steady on the whole, but extremely keen competition is a temptation to some sellers to undersell. Some surplus stocks have recently been offered, tending to unsettle the price situation. Prices are on a par with Seattle and Tacoma, Wash.

Scrap . . .

Scrap Prices, Page 106

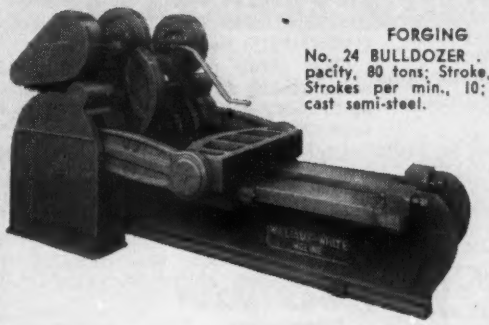
Pittsburgh—There is little prospect major integrated steel producers will re-enter the market for large tonnage dealer open-hearth scrap until clarification of the labor issue. Recent transactions have been at broker-dealer level, either to cover commitments on $21 orders for No. 1 heavy melting or to "lay-down" scrap on speculative basis. Brokers contend they have been forced to pay up to $24 for good open-hearth grades originating from district firms.

It is acknowledged there have been no sales to establish quotations above last mill order of $21 but, on the basis of higher price levels established in those areas from which a large portion of scrap for local mills originates, it is obvious scrap could not be delivered here at the last purchase price level. Higher freight rates, effective Sept. 1, will accentuate this situation. Unconfirmed reports indicate at least one mill's offer to pay $24 was rejected.

Sharpest price advances in scrap quotations have occurred in cast scrap items, reflecting slight improvement in foundry operations but more particularly the previous abnormal differential between these items and pig iron. No. 1 cupola and machinery cast are up about $10 from recent low.

Philadelphia—Upward trend in scrap prices continues, although buyers of open-hearth scrap are still ordering lightly. Still higher prices are indicated, although nothing in the way of a runaway market appears in prospect. Higher prices al-

a full line . . .
PRODUCTION MACHINERY



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No. 24 BULLDOZER . . . Capacity, 80 tons; Stroke, 18 in.; Strokes per min., 10; Frame, cast semi-steel.

BENDING
No. 22 EYEBENDER . . . Capacity 1½" round bar hot on 2" mandrel; ¾" round bar cold on 1¼" mandrel. 12 S.P.M.

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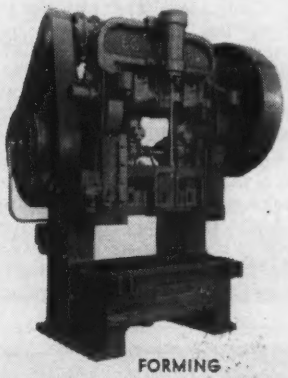
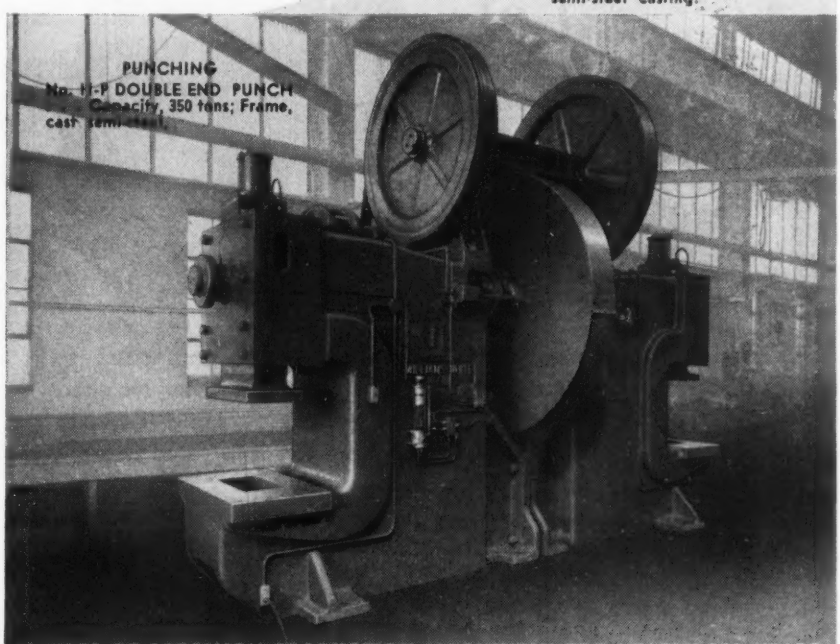


FORMING
No. 6 G-48 GAP FRAME PRESS . . . Capacity, 125 tons; Strokes per min., 35; Frame, semi-steel casting.



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No. 1-P DOUBLE END PUNCH . . . Capacity, 350 tons; Frame, cast semi-steel.

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ready have loosened up some tonnage at dealers' yards. A recent railroad opening reflected an increase in the bid for No. 1 railroad steel of at least $2 or so above that of a month ago.

No. 1 heavy melting steel is now holding at $20.50 delivered; No. 2 heavy melting and No. 1 busheling, $19; No. 1 bundles, $20.50; No. 2 bundles, $18. Bar crop and plate and punchings and plate scrap are slightly higher at $25, delivered, and cut structurals at $24. Electric furnace bundles have undergone a substantial increase, to $21.50. Heavy turnings are higher at $20.50.

Cast scrap is strong with No. 1 cupola cast at $28-$29 and charging box and heavy breakable cast at $27-$28. No. 1 cast wheels are higher at $32.

Boston—Yard dealers are reluctant to sell steelmaking scrap at current prices and most of them are holding tonnage where possible. There is some broker buying at around $11.50 for No. 1 heavy melting steel, but consumers for the most part are marking time.

New York—Brokers' buying prices are strong but unchanged, except for punchings and plate scrap and cut structurals which are now higher at $19 and $20, f.o.b. shipping point, and electric furnace bundles which are up about $1.50 to $19.

Chicago—Undertone of the scrap market remains strong, although still lacks much mill buying support. No. 1 heavy melting steel in limited quantity is bringing as high as $23.50 delivered here. The tonnage involved at this price is insufficient, however, to make the market.

Buffalo—Despite absence of important steel mill scrap buying, brokers and dealers, show no signs of yielding in their ideas on prices, which are nominally unchanged.

One of the chief consumers here is reported to have bought a small tonnage of No. 2 heavy melting and No. 2 bundles in the Boston area at the equivalent of $24.30 and $22.30, respectively, delivered Buffalo.

Cast scrap prices are strong with sales at $29 and $30 for No. 1 cupola to foundry consumers cleaning up excess supplies in this market.

Cincinnati—Scrap prices in this district are unchanged on lack of test in tonnage buying. Undertone is strong, reflecting an uptrend in other districts and reappearance of spotty foundry demand. One district mill has resumed shipments against old orders.

Birmingham—With heavy melting steel scrap at $20 and with increased levels, scrap may advance further but moderately again this week. Not a great deal of material is in local yards and much of the price increase is attributed to the fact that truckers declined to handle tonnage under previous price ranges.

St. Louis—Foundry grade scrap prices are $1 to $3 higher under impetus of continued buying to raise inventories from the hand-to-mouth levels.

Heavy melting steel prices have remained stationary at about $23 for No. 1 the last two weeks. Scrap supplies in this district continue to dry up and mills in Houston, Birmingham and Atlanta are putting a new drain on them.

Dallas—Scrap brokers and dealers report some tendencies toward more active business. Sheffield Steel Co. at Houston, one of the major buyers in this area, continues to take metal as needed, paying around $15 to $16 a ton gross, Dallas basis, unchanged for several weeks.

Portland, Oreg. — The local mill reports scrap available in ample quantities for its current needs, base price being $16 for No. 1 and No. 2 heavy melting which is on a par with the Seattle market.

Cleveland—In the absence of any substantial new buying there was considerable difference of opinion here last week as to what scrap was worth. Some contended the quotation on No. 1 heavy melting steel should be $20, while others said that in view of what brokers were having to pay to cover on old orders the current quotation should be not less than $23.00-23.50. One buyer expressed belief he could not buy today for $20 but said that he thought price pressure would ease by mid-September. Prices on foundry grades are higher.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1500 tons, four-story power plant extension, Montaup Electric Co., Somerset, Mass., to Steel Construction Co., Boston; Stone & Webster Engineering Corp., Boston, contractor-engineer.

1400 tons, McNary dam, Columbia river, to Gunderson Bros. Engineering Corp., Portland, Oreg.

1050 tons, Pennsylvania turnpike, sections 21-BE and 22-A1, Cumberland county, Pennsylvania, to Fort Pitt Bridge Works, Pittsburgh.

900 tons, Federal Reserve Bank building, Portland, Oreg., to Gunderson Bros. Engineering Corp., Portland; previously reported 650 tons.

500 tons, Sauvies Island state bridge, Portland, Oreg., to Poole, McGonigle & Dick, Portland.

475 tons, Wychoff Heights Hospital, Brooklyn, N. Y., to Grand Iron Works Inc., New York.

450 tons, manufacturing plant, Aluminum Foils Inc., Jackson, Tenn., to Pigeon-Thomas Iron Co., Memphis, Tenn.; Foster-Creighton Co., Nashville, Tenn., general contractor.

300 tons, Ankeny street bridge ramp and handrail, Portland, Oreg., to Gunderson Bros. Engineering Corp., Portland.

150 tons, Washington state Yakima bridge and Oregon state Baker underpass, to Poole, McGonigle & Dick, Portland.

STRUCTURAL STEEL PENDING

1200 tons, stock and brew house, National Brewing Co., Baltimore; bids Sept. 1.

820 tons, Seabright state bridge, Monmouth county, New Jersey; bids Sept. 15; also 205 tons of reinforcing steel and 36 tons of machinery.

300 tons, nylon plant, Du Pont interests, Seaford, Del.; bids asked.

200 tons, state bridge, Middlesex county, New Jersey; J. F. Chapman, Hillside, N. J., low on general contract.

179 tons, state bridge, Crawford county, Pennsylvania; bids Sept. 15.

150 tons, veterans hospital, Baltimore; bids asked.

130 tons, state bridge, Adams county, Pennsylvania; bids Sept. 9.

65 tons, municipal filtration plant, Cleveland; bids Sept. 2.

Unstated tonnage, Chelsea-Biltmore apartment, Atlantic City, N. J.; bids Aug. 29;

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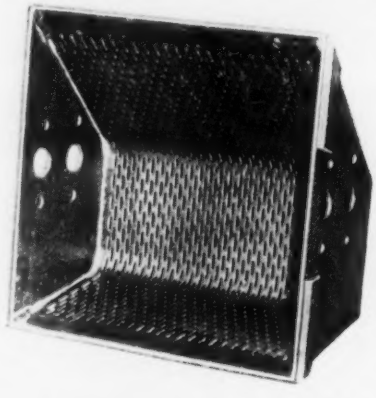

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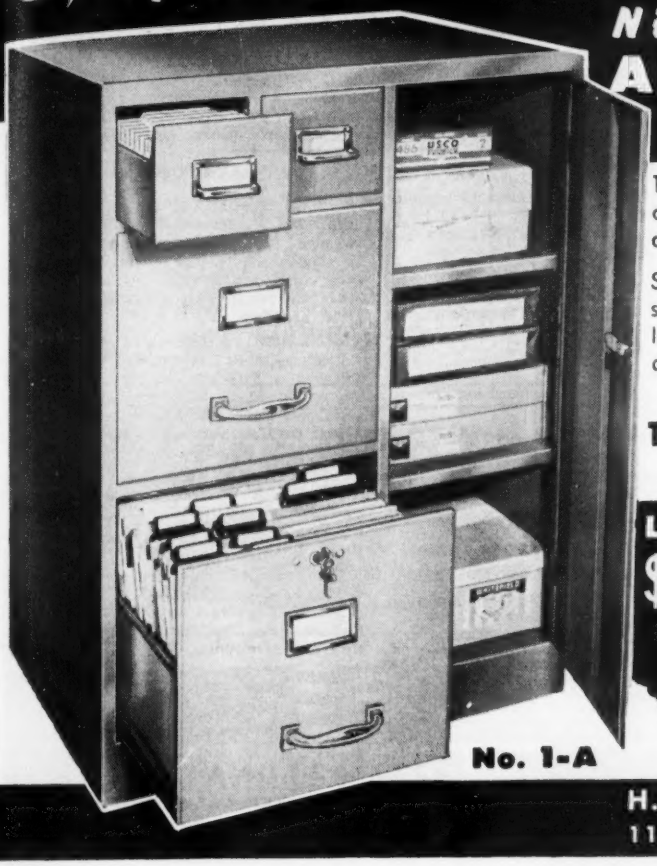

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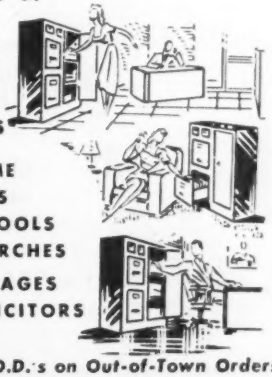

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8000 tons, Hungry Horse, Mont., dam project, to Oregon Steel Mills, Portland, Oreg.

800 tons, Portland, Oreg., sewer system and treatment plant, to Mercer Steel Co., Portland; L. H. Hoffman, general contractor.

647 tons, Indian service native hospital, Anchorage, Alaska, to Soule Steel Co., Portland, Oreg.; previously reported 500 tons.

590 tons, sewer outfall, Portland, Oreg., to Soule Steel Co., Portland.

500 tons, Broadway underpass, Portland, Oreg., to Truscon Steel Co., Portland; C. J. Montag, general contractor.

490 tons, King Tower apartments, Portland, Oreg., to Mercer Steel Co., Portland; Reimers & Jolivet, general contractors.

400 tons, state bridge, Eugene, Oreg., to Mercer Steel Co., Portland; Tom Lillebo, Reedsport, Oreg., general contractor.

260 tons, Baker, Oreg., state underpass, to Mercer Steel Co., Portland; Valley Construction Co., general contractor.

200 tons, city schools, Portland, Oreg., to Soule Steel Co., Portland.

190 tons, power plant extension, Montaup Electric Co., Somerset, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Stone & Webster Engineering Corp., Boston, contractor-engineer.

125 tons, wharf and footings, state pier, Fall River, Mass., to Northern Steel Co., Boston; Henry N. Livingston Co., Quincy, Mass., general contractors.

115 tons, Federal Reserve Bank building, Portland, Oreg., to Soule Steel Co., Portland.

100 tons, manufacturing plant, Aluminum Foils Inc., Jackson, Tenn., to Jones & Laughlin Steel Corp., Memphis, Tenn.; Foster-Creighton Co., Nashville, general contractor; 100,000 square feet mesh, to W. S. Trimble Co., Knoxville, Tenn.

REINFORCING BARS PENDING

5000 tons, hospital, Bethesda, Md.; John McShane, Philadelphia, low on general contract.

216 tons, state road work, Berks county, Pennsylvania; bids Sept. 9.

205 tons, Seabright state bridge, Monmouth county, New Jersey; bids Sept. 15.

PLATES . . .

PLATES PLACED

1000 tons, penstocks for California-Oregon Power Co., to American Pipe & Construction Co., Portland, Oreg.

300 tons, (including shapes) three ¾ yard steel dredges for shipment to Philippine Islands, by U. S. engineers, to Willamette Iron & Steel Corp., Portland, Oreg.

250 tons, water storage tank, Grandview, Wash., to American Pipe & Construction Co., Portland, Oreg.

125 tons, storage tank for U. S. Navy, Spokane, Wash., to American Pipe & Construction Co., Portland, Oreg.

RAILS, CARS . . .

RAILROAD CARS PLACED

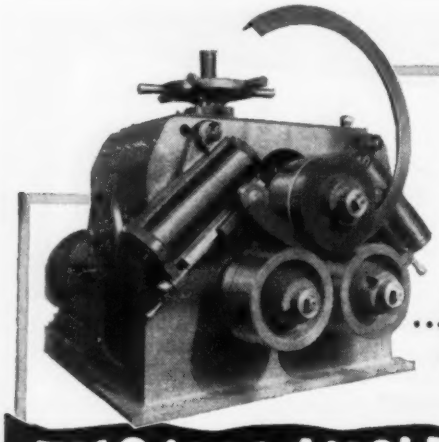
Canadian National, two depressed flat cars, to Canadian Car & Foundry Co., Montreal.

Louisville & Nashville, one hundred 70-ton hopper cars, to the Bessemer, Ala., plant of Pullman-Standard Car Mfg. Co., Chicago.

New Jersey, Indiana & Illinois, fifty 50-ton box cars, to American Car & Foundry Co., New York.

New Orleans Public Belt, seven 70-ton covered hopper cars, to the Haffner-Thrall Car Mfg. Co., Chicago.

Louisville & Nashville, 100 seventy-ton steel hopper cars, to Birmingham, Ala., plant of Pullman-Standard Car Mfg. Co., Chicago.



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CONSTRUCTION AND ENTERPRISE

ALABAMA

DOTHAN, ALA.—Hedstrom Union Co., c/o contractor, has awarded a $200,000 contract to Chapman Construction Co. for a mill.

CALIFORNIA

EAST LOS ANGELES, CALIF.—Mauck-Hill Corp., 210 W. Seventh St., Los Angeles, has awarded a $140,000 contract to Howard Hastings, 1135 N. Las Palmos St., Los Angeles, for construction of a warehouse. Stiles Clements, Van Nuys Bldg., Los Angeles, architect.

LONG BEACH — Associated Telephone Co., 1314 Seventh St., Santa Monica, Calif., has awarded a $400,000 contract to George W. Carter Co., 1721 W. Olympic St., Los Angeles, for construction of a telephone office; Albert C. Martin & Associates, 333 S. Beaudry St., Los Angeles, architect.

OXNARD, CALIF.—Allis-Chalmers Mfg. Co., 558 South B St., has awarded a $175,000 contract to Gridley Construction Co., Box 649, for a shop; Moffatt & Nichols, Kress Bldg., Long Beach, Calif., architect.

SOUTH SAN FRANCISCO, CALIF.—Stewart & Warner Corp., 601 Turk St., has awarded a $120,000 contract to Carlray Co., 672 El Camino Real, San Carlos, Calif., for a factory and salesroom.

TORRANCE, CALIF. — General Petroleum Corp., 108 W. Second St., Los Angeles, has awarded a $2,250,000 contract to Bechtel Corp., Box 156, for construction of a refinery; M. W. Kellogg Co., 225 Broadway, New York, engineer.

WHITEWATER, CALIF.—S. A. Gulberson Jr., 2361 Hollyridge Dr., Los Angeles, has awarded a $15 million contract for cement mill to McNeil Construction Co., 5860 Avalon Blvd., Los Angeles.

DISTRICT OF COLUMBIA

WASHINGTON—Veterans Administration has received bids from following contractors for construction of a 500-bed general medical and surgical hospital in Ann Arbor, Mich. J. D. Hedin Construction Co., Washington, $7,250,000; Kuhney-Simmons Co., Detroit, $7,550,000; Del E. Webb Construction Co., Los Angeles, $7,777,777. Elevator firms bidding on electric elevators and dumbwaiters to be installed in the new hospital are: Haughton Elevator Co., Washington, $313,596; Otis Elevator Co., Washington, $326,747; Westinghouse Electric Corp., Elevator Division, Jersey City, N. J., $333,400. Firms bidding on refrigerating equipment for the hospital include: York Corp., Philadelphia, $82,928; Kohlenberger Engineering Corp., Fullerton, Calif., $86,561.

INDIANA

NEWCASTLE, IND.—Chrysler Corp., First Ave. & 18th St., will ask bids soon for a plant addition, approximately $200,000.

IOWA

DES MOINES, IOWA—Winston & Newell, 118 Fourth St., has awarded a $400,000 contract to Daley Bros., 1500 Old Country Rd., Belmont, San Francisco, for construction of a warehouse; F. A. Constable, San Francisco, architect.

FLORIDA

GREEN COVE SPRINGS, FLA.—Government has received bids at office, Capt. J. D. Wilson, officer in charge of construction, Naval Base, Charleston, S. C., for compressed air plant and distributing system, NOY 18356, Spec. 2169. Means Construction Co., 945 Phillips St., Jacksonville, Fla., entered the low bid at $297,000.

MICHIGAN

MENOMINEE, MICH. — Board of Public Works awarded a contract for construction

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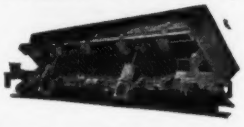

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of an addition to the filter plant, Menominee water station, to Albert Salen, contractor, whose bid was $28,871; Burns & McDonnell, Kansas City, Mo., consulting engineer.

MISSOURI

ST. LOUIS—Western Printing & Lithographing Co., Racine, Wis., has awarded a $200,000 contract to Fruin-Colnon Contracting Co., 1706 Olive St., for construction of a warehouse and shipping building, 1220 S. Spring Ave.

NEBRASKA

SCOTTSBLUFF, NEBR. — Consumers Public Power District, Columbus, Nebr., is considering building a $1 million power plant; Ray Schacht, c/o owner, engineer.

NEW YORK

NEW YORK—Consolidated Edison Co., 4 Irving Place, considers building a $130,000 substation and pump house at 236-38 Cherry St.; Theron R. Galloway, c/o owner, engineer.

OHIO

CLEVELAND — Forest City Publishing Co., owner of *Cleveland Plain Dealer* and *Cleveland News*, has let contracts for a new building to be built between and connecting the News and Art Gravure buildings. The site is between 1801 and 1845 Superior Ave. N. E.

FOSTORIA, O.—Bersted Mfg. Co. is expanding its plant by an additional building on north side of present plant on Hissong Ave. to provide space for new operations of this electrical appliance manufacturing company; Alfred Bersted, president; L. R. Kranz, contractor.

MIDDLETOWN, O.—Armco Steel Corp. has awarded a $12 million contract to F. H. McGraw Construction Co., First American Bank Bdg., for three furnaces at steel plant.

PORT CLINTON, O.—Nu-Form Battery Corp. of Ohio has been incorporated, and ground has been broken for the initial building construction. Incorporators are Leslie Meyer, Oliver True and Elton Clemons. Factory building will be located on Route 2, south of Black Machine shop.

OKLAHOMA

OKLAHOMA CITY, OKLA.—T. G. & Y. Stores, 825 Broadway, has awarded a $189,600 contract to Charles M. Settle Co., 12 N. W. Eighth St., for construction of a warehouse, 36th & Santa Fe Sts.

PENNSYLVANIA

ELRAMA, PA.—Duquesne Light Co., 435 Sixth Ave., Pittsburgh, has awarded a $28 million contract to Dravo Corp., Dravo Bldg., Pittsburgh, for construction of a power plant, 4 miles above Clairton on Monongahela river.

MCKEESPORT, PA. — National Tube Co., Frick Bldg., Fifth Ave., Pittsburgh, has awarded separate contracts, $1,100,000, for construction of a boiler house, etc.; Stone & Webster Engineering Corp., 49 Federal St., Boston, engineer.

TENNESSEE

MEMPHIS, TENN.—University of Tennessee, 874 Union Ave., has awarded a $1,039,800 general contract to Foster & Creighton, 1352 Madison Ave., for construction of Institute of Pathology.

TEXAS

ABILENE, TEX.—West Texas Utilities Co. will build a $141,000 utilities plant addition, own forces; C. H. Young, c/o owner, chief engineer.

CARTHAGE, TEX.—United Gas Corp. has awarded a $3 million contract to Hudson Engineering Corp., 2711 Danville St., Houston, for construction of a gasoline plant; D. R. Pflug, c/o owner, chief engineer.

FORT WORTH, TEX.—Kimbell Milling Co., 22 S. Main St., has awarded a $250,000 contract to James McDuffe, Texas Hotel, for construction of a grain elevator; Jones-Hettelsater, 1911 Baltimore St., Kansas City, Mo., engineer.

HOUSTON—Singer Sewing Machine Co., M. & M. Bldg., has awarded a $200,000 contract to Thad Dederick Construction Co., 2914 Quenby St., for construction of a shop.

KELSEY, TEX.—Humble Oil & Refining Co., 1216 Main St., Houston, plans to build a $235,000 gas injection plant unit, own forces.

PALESTINE, TEX.—Joyce Motor Co. plans to build a $75,000 service, sales and shop building, owner builds; O. L. Hazelwood, architect.

PICKTON, TEX.—Humble Oil & Refining Co., Cotton Exchange Bldg., Dallas, will soon ask bids for a $2,133,000 plant.

PLAINVIEW, TEX.—Harvest Queen Mill has awarded a $375,000 contract to Johnson-Sampson Co., Salina, Kans., for construction of a grain elevator.

WASHINGTON

SEATTLE—Pacific Stove & Foundry Co., 112 W. Idaho St., may rebuild its factory at an estimated cost of $100,000.

WEST VIRGINIA

TRIADELPHIA, W. VA.—Valley Camp Coal Co., Western Reserve Bldg., Cleveland, has awarded a $300,000 contract to H. L. Seabright Co., 43rd & McCulloch Sts., Wheeling W. Va., for construction of a machine shop and warehouse.

WISCONSIN

MANITOWOC, WIS.—City may take bids in October on 21st Street bridge; plans by C. F. Coifman, engineer, Milwaukee.

RANDOM LAKE, WIS.—Random Lake Co-operative Association is building a $125,000 combination grain elevator, feed and seed plant; construction by J. M. Babcock, Wausau, Wis.

CANADA

MATHESON, ONT.—Canadian Johns-Manville Co. Ltd., Asbestos, Que., has awarded a $3 million contract to Foundation Co. of Ontario Ltd., 1220 Bay St., Toronto, Ont., for construction of mill buildings.

PRICES OF LEADING FERROALLOYS PRODUCTS

(Continued from Page 103)

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C. 0.10% max.) Ton lot $1.28, less ton $1.35. F.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%). Contract, $175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

VANADIUM ALLOYS

Ferrovanadium: Open-Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.), $3.10.

Grainal: Vanadium Grainal No. 1, 93c; No. 6 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carload lots, $1.20 per lb of contained V_2O_5, freight allowed. Spot, add 5c.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more. 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50

Borosil: (3 to 4% B, 40 to 45% Si), $4.25 per lb contained B, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Contract, ton lot, 2" x D, $2.90 per lb of contained Cb, less ton $2.95. Delivered. Spot, add 25c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8% Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Carload packed. 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, M 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 16.5c per lb of alloy, ton lots 17.50c, less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.00c per lb of alloy; ton lots 18.00c; less ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal (Approx. 20% each Si, Mn, Al). Lump, bulk, carload 11.00c. Ton lots, bulk 11.50c, packed 11.75c. Less ton lots, packed 12.55c per lb of alloy, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); Gross tons per carload, f.o.b. sellers' works, Mt. Pleasant, or Siglo, Tenn.; $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb. contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity $1.10.

Technical Molybdic-Oxide: Per lb, contained Mo., f.o.b. Langeloth and Washington, Pa., packed in bags containing 20 lb of molybdenum, 95.00c.

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